Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
PERIMETER	the sum of the side measures around a two-dimensional figure.

Directions: Find the perimeter of each figure.

1.

9 ft

$P = 4(9)$
$\boxed{P = 36 \text{ ft}}$

2.

7.3 m
16.8 m

$P = 2(7.3) + 2(16.8)$
$\boxed{P = 48.2 m}$

3.
16 mm

27.5 mm

$P = 2(16) + 2(27.5)$
$\boxed{P = 87 mm}$

4.

17 yd   15 yd
8 yd

$\boxed{P = 40 \text{ yd}}$

5.

$4\frac{2}{3}$ in
$6\frac{1}{3}$ in

$\boxed{P = 15\frac{2}{3} \text{ in}}$

6.
12.5 m

9 m
3.7 m

$\boxed{P = 34.2 m}$

AREA	The amount of space occupied by a two-dimensional figure.

Directions: Find the area of each figure.

Area of a Square: $\boxed{A = s^2}$	**7.** 5 m $A = 5^2$ $\boxed{A = 25 m^2}$	**8.** 8.1 in $A = 8.1^2$ $\boxed{A = 65.61 in^2}$
Area of a Rectangle: $\boxed{A = l \cdot w}$	**9.** 4 ft 13 ft $A = 13 \cdot 4$ $\boxed{A = 52 ft^2}$	**10.** 11.5 cm 6.2 cm $A = 11.5 (6.2)$ $\boxed{A = 71.3 cm^2}$
Area of a Parallelogram: $\boxed{A = b \cdot h}$	**11.** 5.3 km 9 km $A = 9(5.3)$ $\boxed{A = 47.7 km^2}$	**12.** 25 ft 11 ft 13 ft $A = 13(11)$ $\boxed{A = 143 ft^2}$

	13.	14.
	$A = 8.6(6.5)$ $\boxed{A = 55.9 \ m^2}$ 6.5 m, 8.6 m, 8.4 m	9.5 mi, 8.6 mi, 15 mi $A = 15(8.6)$ $\boxed{A = 129 \ mi^2}$

Area of a Triangle:

$$\boxed{A = \tfrac{1}{2} b \cdot h}$$

15.	16.
17 ft, 14 ft $A = \tfrac{1}{2}(14)(17)$ $\boxed{A = 119 \ ft^2}$	14.5 in, 10 in, 10.5 in $A = \tfrac{1}{2}(10.5)(10)$ $\boxed{A = 52.5 \ in^2}$
17.	18.
18.5 mm, 13.1 mm, 17.2 mm $A = \tfrac{1}{2}(18.5)(13.1)$ $\boxed{A = 121.175 \ mm^2}$	9.8 yd, 33.6 yd, 35 yd $A = \tfrac{1}{2}(9.8)(33.6)$ $\boxed{A = 164.64 \ yd^2}$
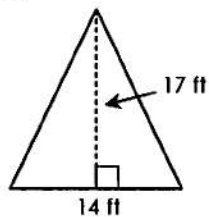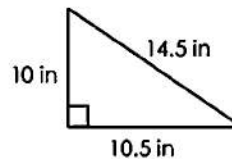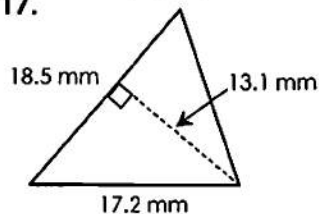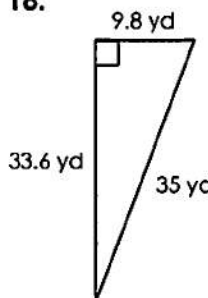
Area of a Trapezoid:

$$\boxed{A = \tfrac{1}{2} h (b_1 + b_2)}$$

19.	20.
5.5 m, 9.4 m, 7 m, 13.7 m $A = \tfrac{1}{2}(7)(5.5 + 13.7)$ $A = (3.5)(19.2) = \boxed{67.2 \ m^2}$	24 ft, 26 ft, 21 ft, 39.3 ft $A = \tfrac{1}{2}(21)(24 + 39.3)$ $A = 10.5(63.3) = \boxed{664.65 \ ft^2}$
21.	22.
6 cm, 9.2 cm, 10 cm, 14 cm $A = \tfrac{1}{2}(9.2)(14 + 6)$ $A = (4.6)(20) = \boxed{92 \ cm^2}$	20.5 in, 7.2 in, 24.8 in, 27 in $A = \tfrac{1}{2}(20.5)(7.2 + 24.8)$ $A = (10.25)(32) = \boxed{328 \ in^2}$
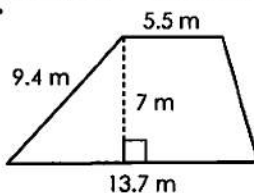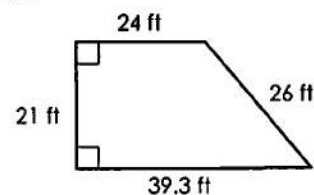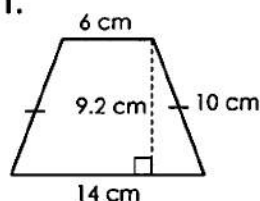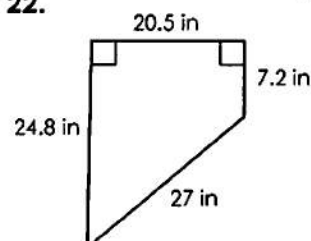
Name:	Date:
Topic:	Class:

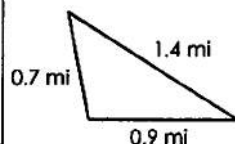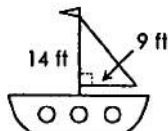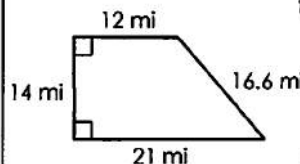| Main Ideas/Questions	Notes/Examples
PERIMETER Applications	1. Mrs. Mank is decorating a 4-foot by 9-foot bulletin board in her classroom. If she decides to put a purple border around the entire board, what is the length of border that she needs? $P = 2(4) + 2(9)$ $P = 8 + 18$ $\boxed{P = 26 \text{ ft}}$	2. Brett warmed up for his basketball game by running around the court three times. If the court is 84 feet by 50 feet, how many feet did he jog? $P = 2(84) + 2(50)$ $P = 168 + 100$ $P = 268$ $268(3) = \boxed{804 \text{ ft}}$
	3. Kate likes to run a route in town that forms a triangle shown below. How many times would she need to run this route to complete 12 miles? $3x = 12$ $\boxed{x = 4 \text{ times}}$ 1.4 mi 0.7 mi 0.9 mi $P = 3 \text{ mi}$	4. The perimeter of a rectangular playground is 86 feet. If the width of the playground is 15 feet, find the length. $86 = 2(15) + 2\ell$ $86 = 30 + 2\ell$ $\dfrac{56}{2} = \dfrac{2\ell}{2}$ $\boxed{\ell = 28 \text{ ft}}$
AREA Applications	5. How much fabric is needed to create the sail below? 14 ft 9 ft o o o $A = \frac{1}{2}(9)(14)$ $\boxed{A = 63 \text{ ft}^2}$	6. Find the width of a rectangular patio with a length of 16 feet and an area of 200 square feet. $A = \ell \cdot w$ $\dfrac{200}{16} = \dfrac{16w}{16}$ $\boxed{w = 12.5 \text{ ft}}$
	7. Ryan is having carpet installed in his 30-foot by 18-foot family room. If the carpet is $2.25 per square foot, how much will it cost him? $A = 30(18) = 540 \text{ ft}^2$ $540(2.25)$ $\boxed{= \$1215}$	8. A town in the shape of a trapezoid has is shown below. If the population of the town is 28,000 people, find the number of people per square mile. 12 mi 14 mi 16.6 mi 21 mi $A = \frac{1}{2}(14)(12 + 21)$ $A = 231 \text{ mi}^2$ $\dfrac{28000}{231} \approx \boxed{121 \text{ people/mi}^2}$

MIXED PRACTICE

9. Hannah just put a 36-foot long fence around her rectangular garden. What is the length of the garden if it is 12 feet wide?
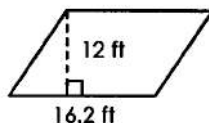
$36 = 2(12) + 2\ell$

$36 = 24 + 2\ell$

$\dfrac{12}{2} = \dfrac{2\ell}{2}$

$\boxed{\ell = 6 \text{ ft}}$

10. Dave is adding a new patio to the back of his house. The dimensions of the patio are shown below. If one bag of concrete mix will cover 50 square feet, how many bags of concrete will he need?

12 ft
16.2 ft

$A = 16.2(12) = 194.4 \text{ ft}^2$
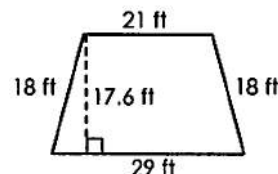
$\dfrac{194.4}{50} = 3.888$ $\boxed{4 \text{ bags}}$

11. A campground covers their rectangular-shaped pool each winter. If the area of the cover is 333.5 square feet, and the pool is 23 feet long, find the width.
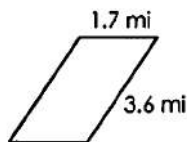
$\dfrac{333.5}{23} = \dfrac{23(w)}{23}$

$\boxed{14.5 \text{ ft} = w}$

12. A fence is being built around a small park. How many feet of fence will be needed to surround the park?

21 ft
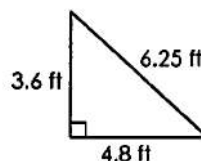18 ft · 17.6 ft · 18 ft
29 ft

$18 + 21 + 18 + 29 = \boxed{86 \text{ ft}}$

13. The dimensions of a city park are shown below. Sam just jogged around the park twice. How many miles did he jog?

1.7 mi
3.6 mi

$2(1.7) + 2(3.6) = 10.6$

$2(10.6) = \boxed{21.2 \text{ mi}}$

14. Ella is making a corner bench seat. She plans to outline the seat cushion in a decorative ribbon. How much ribbon will she need?

6.25 ft
3.6 ft
4.8 ft

$3.6 + 4.8 + 6.25 = \boxed{14.65 \text{ ft}}$

15. Rachel is making a tent. The triangular piece of fabric for the front of her tent has an area of 24 square feet. Find the height of the fabric if it is 6 feet long at its base.

$\frac{1}{2}(6)(h) = 24$

$\dfrac{3h}{3} = \dfrac{24}{3}$

$\boxed{h = 8 \text{ ft}}$

16. Marina is making a cake in a pan shaped like the one below. One can of frosting will cover 40 square inches of cake. How many cans of frosting will she need?

4.2 in
9 in
14.5 in
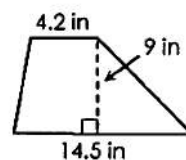
$A = \frac{1}{2}(9)(4.2 + 14.5)$
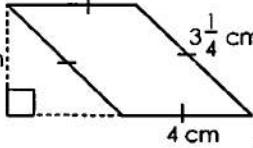
$= (4.5)(18.7)$

$= 84.15$
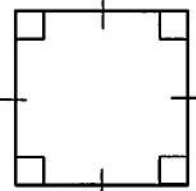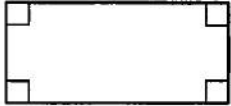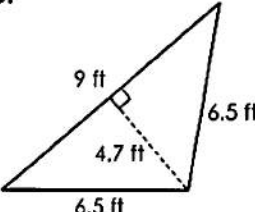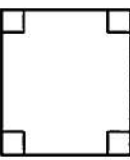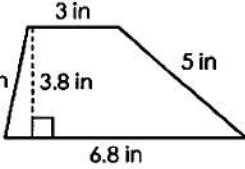
$\dfrac{84.15}{40} = 2.1035$ $\boxed{3 \text{ cans}}$
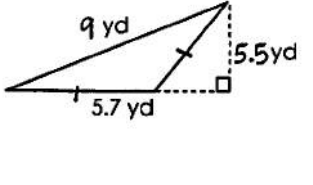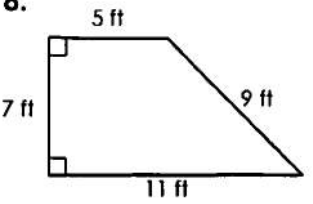
Name: _____   **Unit 7:** Measurement (Area and Volume)

Date: _____ **Per:** _____   **Homework 1:** Perimeter & Area
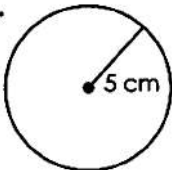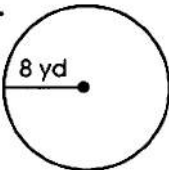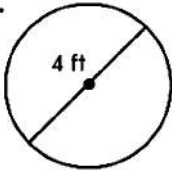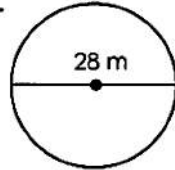
** This is a 2-page document! **

Directions: Find the perimeter and area of each figure.

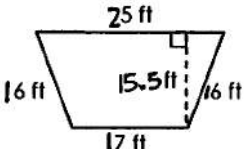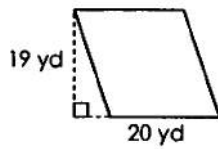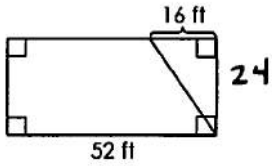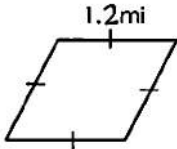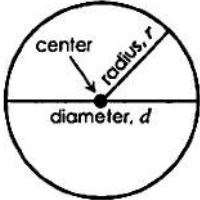|	Perimeter	Area
1. 4.2 m	$P = 4(4.2)$ $= \boxed{16.8 \text{ m}}$	$A = (4.2)^2$ $= \boxed{17.64 \text{ m}^2}$
2. 5 in, 12 in	$P = 2(12) + 2(5)$ $= \boxed{34 \text{ in}}$	$A = 12(5)$ $= \boxed{60 \text{ in}^2}$
3. 9 ft, 6.5 ft, 4.7 ft, 6.5 ft	$P = 9 + 2(6.5)$ $= \boxed{22 \text{ ft}}$	$A = \frac{1}{2}(9)(4.7)$ $= \boxed{21.15 \text{ ft}^2}$
4. 2.3 cm, $3\frac{1}{4}$ cm, 4 cm	$P = 2(4) + 2(3\frac{1}{4})$ $= \boxed{14\frac{1}{2} \text{ cm}}$	$A = 4(2.3)$ $= \boxed{9.2 \text{ cm}^2}$
5. 0.8 m, 0.6 m	$P = 2(0.6) + 2(0.8)$ $= \boxed{2.8 \text{ m}}$	$A = 0.6(0.8)$ $= \boxed{0.48 \text{ m}^2}$
6. 3 in, 5 in, 4.1 in, 3.8 in, 6.8 in	$P = 3 + 5 + 6.8 + 4.1$ $= \boxed{18.9 \text{ in}}$	$A = \frac{1}{2}(3.8)(3 + 6.8)$ $= \boxed{18.62 \text{ in}^2}$

7.

9 yd, 5.5 yd, 5.7 yd (triangle)

$P = 9 + 2(5.7)$
$= \boxed{20.4 \text{ yd}}$

$A = \frac{1}{2}(5.7)(5.5)$
$= \boxed{15.675 \text{ yd}^2}$

8.

5 ft, 7 ft, 9 ft, 11 ft (trapezoid)

$P = 7 + 5 + 9 + 11$
$= \boxed{32 \text{ ft}}$

$A = \frac{1}{2}(7)(5+11)$
$= \boxed{56 \text{ ft}^2}$

9. Abraham is fencing in his rectangular backyard. His yard is 42 feet wide and 50 feet long. How many feet of fencing will he need?

$P = 2(42) + 2(50)$
$= \boxed{184 \text{ ft}}$

10. Shelly is putting a child safety fence around the edge of her swimming pool. If the company charges $15 per foot, how much will she pay?

25 ft, 16 ft, 15.5 ft, 16 ft, 17 ft (trapezoid)

$P = 25 + 17 + 2(16)$
$= 74$

$15(74) = \boxed{\$1,110}$

11. Brent's neighborhood is putting down new mulch at the playground and he is in charge of buying the mulch. One bag covers 3 square yards. How many bags will he need?

19 yd, 20 yd (parallelogram)

$A = 19(20)$
$= 380 \text{ yd}^2$

$\frac{380}{3} = 126.\overline{6}$

$\boxed{127 \text{ bags}}$

12. Greg uses a triangular area of his backyard as a garden. If the area of his backyard is 1,248 square feet, what is the area of the garden?

16 ft, 24, 52 ft

$1248 = 52 \cdot w$
$24 = w$

$A = \frac{1}{2}(16)(24)$
$= \boxed{192 \text{ ft}^2}$

13. The map below shows Juan's bike path. How many times would Juan need to bike this path in order to reach a distance of 30 miles?

1.2 mi (rhombus)

$P = 4(1.2) = 4.8$

$\frac{30}{4.8} = 6.25$

$\boxed{6\frac{1}{4} \text{ times}}$

14. Karl is replacing his concrete driveway with rectangular pavers. Each paver has an area of 4.5 square feet. Karl's driveway is 21 feet long and 18 feet wide. How many pavers will he need?

$A = 18(21) = 378 \text{ ft}^2$

$\frac{378}{4.5} = \boxed{84 \text{ pavers}}$

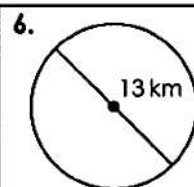| Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
CIRCLE	A set of points equidistant from a given point called the center.
PARTS OF A CIRCLE	**Center:** The given point in which all points are the same distance from.
	Radius, r: The distance from the center to any point on the circle.
	Diameter, d: The distance across the circle through the center. The diameter is twice the radius. $(d=2r)$
CIRCUMFERENCE OF A CIRCLE	The distance around, or perimeter of a circle.

Parts of a circle diagram showing center, radius r, diameter d.

FORMULA:

$$C = 2\pi r$$

Find the circumference of each circle. Use 3.14 for pi.

1.

5 cm

$C = 2\pi 5$

$= 10(3.14)$

$= \boxed{31.4 \, cm}$

2.

8 yd

$C = 2\pi 8$

$= 16(3.14)$

$= \boxed{50.24 \, yd}$

3.

4 ft

$C = 2\pi 2$

$= 4(3.14)$

$= \boxed{12.56 \, ft}$

4.

28 m

$C = 2\pi 14$

$= 28(3.14)$

$= \boxed{87.92 \, m}$

5.

3.2 in

$C = 2\pi \cdot 3.2$
$= 6.4(3.14)$
$= \boxed{20.096 \text{ in}}$

6.

13 km

$C = 2\pi \cdot 6.5$
$= 13(3.14)$
$= \boxed{40.82 \text{ km}}$

7.

15.6 cm

$C = 2\pi \cdot 7.8$
$= 15.6(3.14)$
$= \boxed{48.984 \text{ cm}}$

8.

12.5 m

$C = 2\pi \cdot 12.5$
$= 25(3.14)$
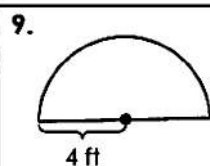$= \boxed{78.5 \text{ m}}$

SEMI-CIRCLES

Steps:
1) Find half of the circumference.

2) Add the diameter.

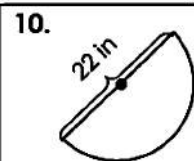A semicircle is one-half of a circle.

Find the circumference each semicircle. Use 3.14 for pi.

9.

4 ft

$C = \frac{1}{2}(2\pi \cdot 4) + 8$
$= 4(3.14) + 8$
$= \boxed{20.56 \text{ ft}}$

10.

22 in

$C = \frac{1}{2}(2\pi \cdot 11) + 22$
$= 11(3.14) + 22$
$= \boxed{56.54 \text{ in}}$

APPLICATIONS

11. Find the distance a wheel with a diameter of 28 centimeters would travel in one revolution.

$C = 2\pi \cdot 14$
$= 28(3.14)$
$= \boxed{87.92 \text{ cm}}$

12. If the minute hand on the clock below has a radius of 7.5 inches, how far will the hand travel in a 24-hour day?

$C = 2\pi \cdot 7.5$
$= 15(3.14)$
$= 47.1$

$24(47.1) = \boxed{1130.4 \text{ in}}$

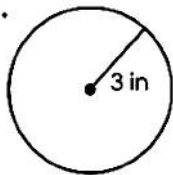Name: _____   **Unit 7:** Measurement (Area and Volume)

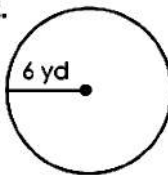Date: _____ Per: _____   **Homework 2:** Circumference of Circles

** This is a 2-page document! **

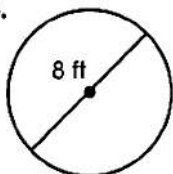**Directions:** Find the circumference of each circle. Use 3.14 for pi.

1.

3 in

$C = 2\pi 3$

$= 6(3.14)$

$= \boxed{18.84 \text{ in}}$

2.

6 yd

$C = 2\pi 6$

$= 12(3.14)$

$= \boxed{37.68 \text{ yd}}$

3.

8 ft

$C = 2\pi 4$

$= 8(3.14)$

$= \boxed{25.12 \text{ ft}}$

4.

24 yd

$C = 2\pi 12$

$= 24(3.14)$

$= \boxed{75.36 \text{ yd}}$

5.

4.2 in
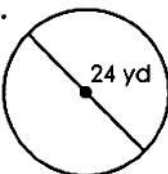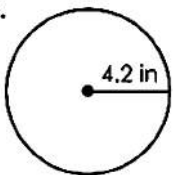
$C = 2\pi 4.2$

$= 8.4(3.14)$

$= \boxed{26.376 \text{ in}}$

6.

15 m
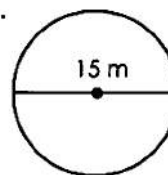
$C = 2\pi 7.5$

$= 15(3.14)$

$= \boxed{47.1 \text{ m}}$

Directions: Find the perimeter of each circle. Use 3.14 for pi.

7.

23 cm
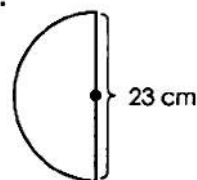
$C = \frac{1}{2}(2\pi \, 11.5) + 23$

$= 11.5(3.14) + 23$

$= \boxed{59.11 \text{ cm}}$

8.

18 in

$C = \frac{1}{2}(2\pi \, 18) + 36$

$= 18(3.14) + 36$

$= \boxed{92.52 \text{ in}}$

9.

1.6 ft
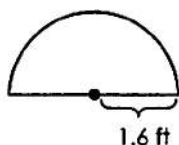
$C = \frac{1}{2}(2\pi 1.6) + 3.2$

$= 1.6(3.14) + 3.2$

$= \boxed{8.224 \text{ ft}}$

10.

42 mm
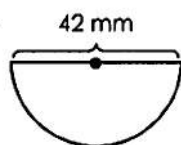
$C = \frac{1}{2}(2\pi 21) + 42$

$= 21(3.14) + 42$

$= \boxed{107.94 \text{ mm}}$

11. Addie decorates round cake trays. She is putting ribbon around a cake tray that has a diameter of 18 inches. How long does the ribbon need to be?

$C = 2\pi 9$

$= 18(3.14)$

$= \boxed{56.52 \text{ in}}$

12. Sam owns a restaurant that specializes in calzones. What is the perimeter of the largest calzone?

$C = \frac{1}{2}(2\pi 8) + 16$

$= 8(3.14) + 16$

$= \boxed{41.12 \text{ in}}$

8 in
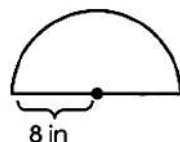
13. A landscaping company is putting small stones around a circular fish pond with a diameter of 5.5 yards. If each bag of stones fills a distance of 4 yards, how many bags do they need?

$C = \pi 5.5$

$= 5.5(3.14)$

$= 17.27 \text{ yd}$

$\frac{17.27}{4} = 4.3175$ $\boxed{5 \text{ bags}}$

14. Regina is tying a bow around a soccer ball to give to her sister. The ball has a radius of 4.5 inches. If the ribbon needs to be 10 inches longer than the circumference of the ball so she has enough room to tie a bow, how many inches of ribbon will she need?

$C = 2\pi 4.5$

$= 9(3.14)$

$= 28.26$

$\boxed{38.26 \text{ in}}$

15. Dan is putting a fence around his circular swimming pool. If the pool has a diameter of 13.5 feet and fencing costs $6 per foot, how much will he spend?

$C = \pi 13.5$

$= 13.5(3.14)$

$= 42.39$

$42.39(6) = \boxed{\$254.34}$

16. Ellen has two pizzas left after a party. One is whole and one has been half-eaten. The whole pizza has a radius of 7 inches. The half eaten pizza has a diameter of 20 inches. Which pizza has a greater circumference?

A: $C = 2\pi 7$

$= 14(3.14)$

$= 43.96 \text{ in}$

B: $C = \frac{1}{2}(2\pi 10) + 20$

$= 10(3.14) + 20$

$= 51.4 \text{ in}$

$\boxed{\text{The half pizza has a greater circumference.}}$

Name:	Date:
Topic:	Class:

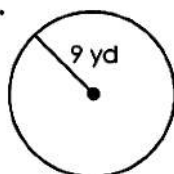| Main Ideas/Questions	Notes/Examples

AREA OF A CIRCLE

The amount of space occupied by a circle.

FORMULA:

$A = \pi r^2$

Find the area of each circle. Use 3.14 for pi.

1.

9 yd
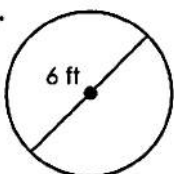
$A = \pi (9)^2$

$= 81(3.14)$

$= \boxed{254.34 \text{ yd}^2}$
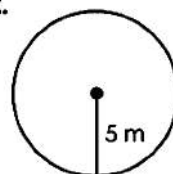
2.

5 m

$A = \pi (5)^2$

$= 25(3.14)$

$= \boxed{78.5 \text{ m}^2}$

3.

6 ft

$A = \pi (3)^2$

$= 9(3.14)$

$= \boxed{28.26 \text{ ft}2}$

4.

26 km
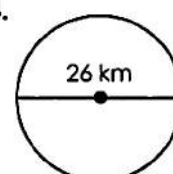
$A = \pi (13)^2$

$= 169(3.14)$

$= \boxed{530.66 \text{ km}^2}$

5.
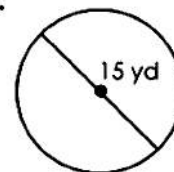
15 yd

$A = \pi (7.5)^2$

$= 56.25(3.14)$

$= \boxed{176.625 \text{ yd}^2}$

6.

1.2 m
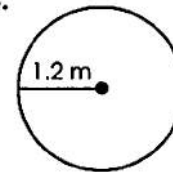
$A = \pi (1.2)^2$

$= 1.44(3.14)$

$= \boxed{4.5216 \text{ m}^2}$
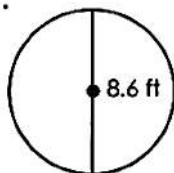
|		
	7. $A = \pi (4.3)^2$ $= 18.49 (3.14)$ $= \boxed{58.0586 \ ft^2}$	**8.** $A = \pi (10.4)^2$ $= 108.16(3.14)$ $= \boxed{339.6224 \ in^2}$
SEMICIRCLES	**Find the area of each semicircle. Use 3.14 for pi.** **9.** 12 cm $A = \frac{1}{2}\pi (12)^2$ $= \frac{1}{2}(144)(3.14)$ $= 72(3.14)$ $= \boxed{226.08 \ cm^2}$	**10.** 5 ft $A = \frac{1}{2}\pi (2.5)^2$ $= \frac{1}{2}(6.25)(3.14)$ $= 3.125(3.14)$ $= \boxed{9.8125 \ ft^2}$
APPLICATIONS	**11.** A table in the shape of a circle has a diameter of 6 feet. How much fabric is needed to make a table cloth if it hangs 1 foot off the table all the way around? $(D = 8 \ ft)$ $A = \pi (4)^2$ $= 16(3.14)$ $= \boxed{50.24 \ ft^2}$	**12.** Jane has a circular garden with a diameter of 16 feet. If one bag of fertilizer covers 30 square feet, how many bags will she need to cover the garden? $A = \pi (8)^2$ $= 64(3.14)$ $= 200.96$ $\frac{200.96}{30} \approx 6.7$ $\boxed{7 \ bags}$
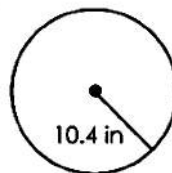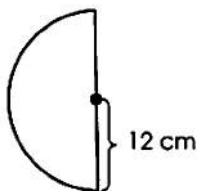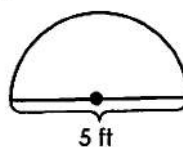
Circumference & Area of Circles Maze!

Directions: Find the circumference or area of each circle, using 3.14 for pi. Use your solutions to navigate through the maze. Staple all work to this paper!
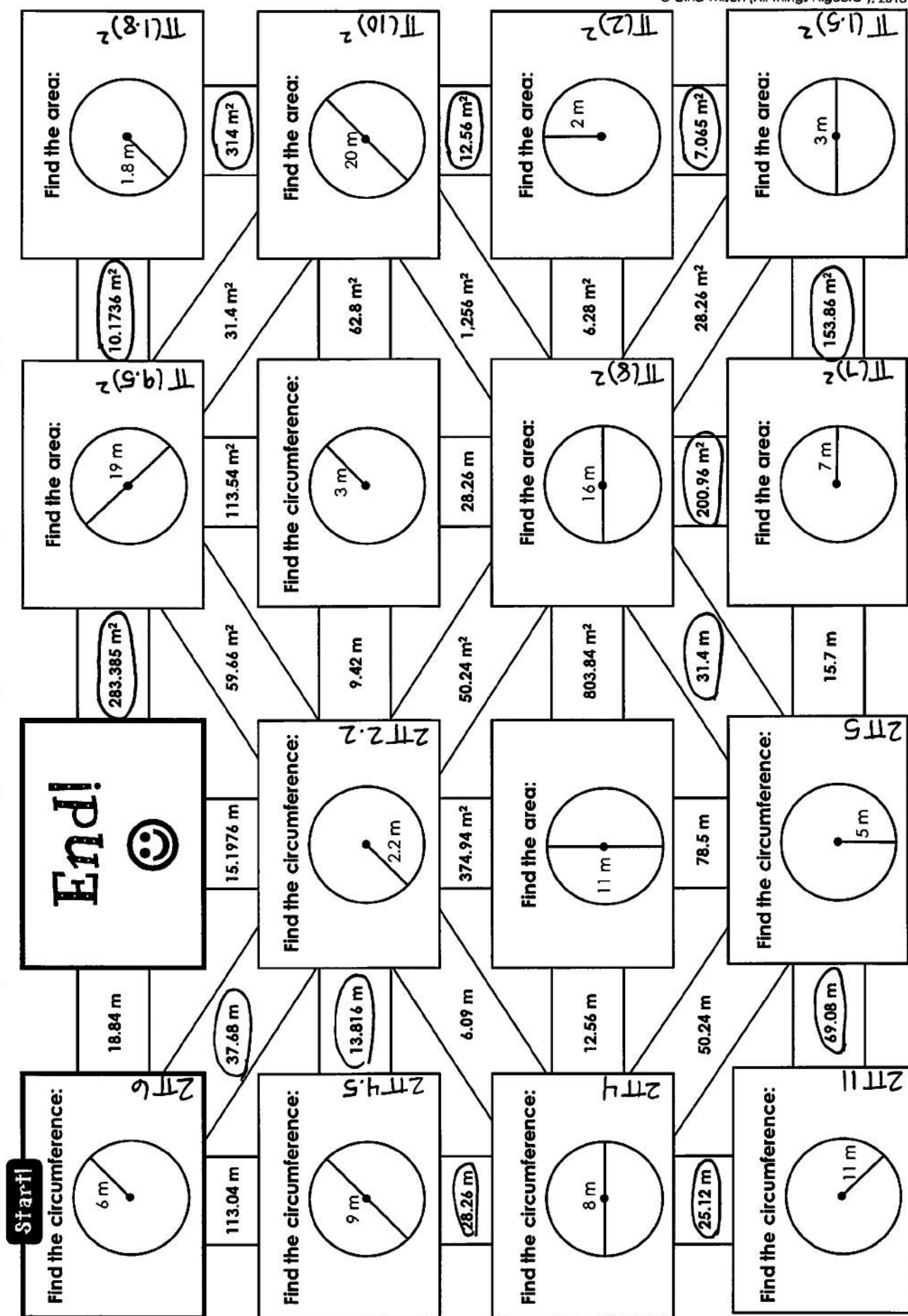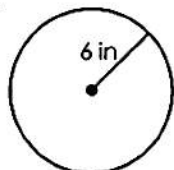
Name: _____   **Unit 7:** Measurement (Area and Volume)
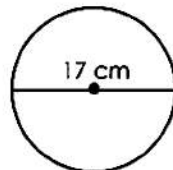
Date: _____ **Per:** _____   **Homework 3:** Area of Circles

** This is a 2-page document! **

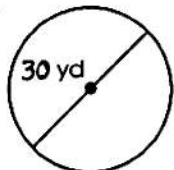**Directions:** Find the area of each circle or semicircle. Use 3.14 for pi.

1.

6 in

$A = \pi (6)^2$

$= 36 (3.14)$

$= \boxed{113.04 \text{ in}^2}$

2.

17 cm

$A = \pi (8.5)^2$

$= 72.25 (3.14)$

$= \boxed{226.865 \text{ cm}^2}$

3.

30 yd

$A = \pi (15)^2$

$= 225 (3.14)$

$= \boxed{706.5 \text{ yd}^2}$

4.

3.2 in
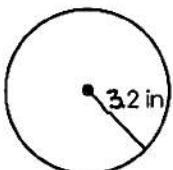
$A = \pi (3.2)^2$

$= 10.24 (3.14)$

$= \boxed{32.1536 \text{ in}^2}$

5.

7.1 in
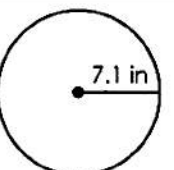
$A = \pi (7.1)^2$

$= 50.41 (3.14)$

$= \boxed{158.2874 \text{ in}^2}$

6.

50 m
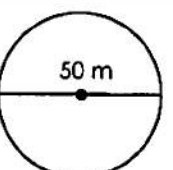
$A = \pi (25)^2$

$= 625 (3.14)$

$= \boxed{1962.5 \text{ m}^2}$

7.

3 ft
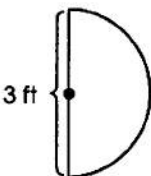
$A = \frac{1}{2} \cdot \pi (1.5)^2$

$= \frac{1}{2} (2.25)(3.14)$

$= \boxed{3.5325 \text{ ft}^2}$

8.

5 cm

$A = \frac{1}{2} \pi (5)^2$

$= \frac{1}{2} (25)(3.14)$

$= \boxed{39.25 \text{ cm}^2}$

© Gina Wilson (All Things Algebra®), 2018

9.

8 cm
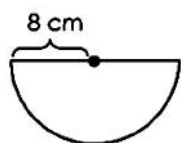
$A = \frac{1}{2}\pi(8)^2$

$= \frac{1}{2}(64)(3.14)$

$= \boxed{100.48 \text{ cm}^2}$

10.

34 ft
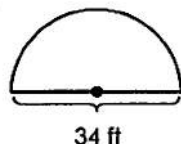
$A = \frac{1}{2}\pi(17)^2$

$= \frac{1}{2}(289)(3.14)$

$= \boxed{453.73 \text{ ft}^2}$

11. Diana is painting a circular mural on her wall. Her mural is going to have a diameter of 7 feet. How much wall space will she be painting?

$A = \pi(3.5)^2$

$= 12.25(3.14)$

$= \boxed{38.465 \text{ ft}^2}$

12. Mrs. Vickers is covering her student work table with chalkboard paper. The table has a radius of 3.8 feet. How much paper will she need?

$A = \pi(3.8)^2$

$= 14.44(3.14)$

$= \boxed{45.3416 \text{ ft}^2}$

13. Maggie is creating a cushion for a circular stool. The stool has a diameter of 16 inches. If she needs fabric to extend 2 inches all the way around the cushion, how much fabric will she need? $(D = 20)$

$A = \pi(10)^2$

$A = 100(3.14)$

$A = \boxed{314 \text{ in}^2}$

14. The Roberts Family is getting an inground circular pool with a radius of nine feet. The company needs to dig out an extra three feet all the way around the pool to have room for plumbing. What is the area of the grass that will be removed? $(R = 12)$

$A = \pi(12)^2$

$= 144(3.14)$

$= \boxed{452.16 \text{ ft}^2}$

15. Marcus ate one-half of a pizza with a radius of 7 inches. If the pizza has 180 calories per 16 square inches, how many calories did he eat?

$A = \frac{1}{2}\pi(7)^2$

$= \frac{1}{2}(49)(3.14)$

$= 76.93 \text{ in}^2$

$\frac{76.93}{x} = \frac{16}{180};$ $16x = 13847.4$

$\boxed{x = 865.4625 \text{ cal}}$

16. Bob needs to buy a cover for his above ground pool. The pool is in the shape of a circle and has a diameter of 18 feet. Pool covers cost $0.75 per square foot. How much should Bob expect to spend on a pool cover?

$A = \pi(9)^2$

$= 81(3.14)$

$= 254.34 \text{ ft}^2$

$254.34(0.75) = \boxed{\$190.76}$

Name: _____ **Math 7**

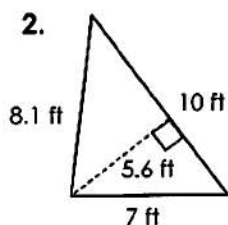**Date:** _____ **Per:** _____ **Unit 7:** Measurement (Area & Volume)

Quiz 7-1: Area & Perimeter of Plane Figures
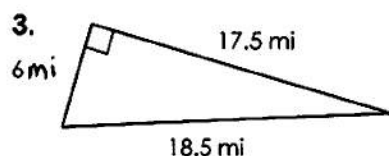
Find the perimeter and area of each figure.

1.

15.2 cm
20 cm
18.8 cm

$P = 2(20) + 2(18.8)$

$A = (15.2)(20)$

2.

8.1 ft
10 ft
5.6 ft
7 ft
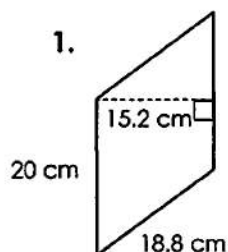
$P = 8.1 + 7 + 10$
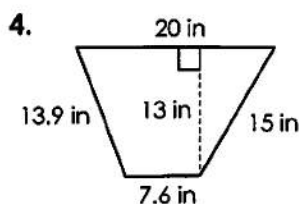
$A = \frac{1}{2}(10)(5.6)$

1. $P = $ __77.6 cm__

   $A = $ __304 cm²__

2. $P = $ __25.1 ft__

   $A = $ __28 ft²__

3. $P = $ __42 mi__

   $A = $ __52.5 mi²__

4. $P = $ __56.5 in__

   $A = $ __179.4 in²__

3.

6 mi
17.5 mi
18.5 mi

$P = 6 + 17.5 + 18.5$

$A = \frac{1}{2}(17.5)(6)$

4.

20 in
13.9 in   13 in   15 in
7.6 in

$P = 20 + 15 + 7.6 + 13.9$

$A = \frac{1}{2}(13)(20 + 7.6)$

5. It cost Randy $515.20 for new carpet in his bedroom. If the room is 11.5 feet wide by 14 feet long, what was the cost per square foot?
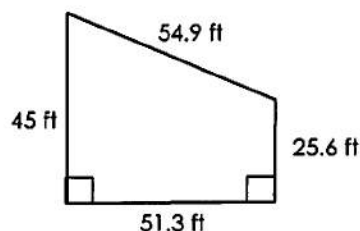
$A = 11.5(14)$
$= 161$ ft²

$\dfrac{515.2}{161} = 3.2$

5. __$3.20__

6. __4 rolls__

6. The crime scene with dimensions below is being taped off. If each roll of tape is 50 feet long, how many rolls are needed to tape off the scene?
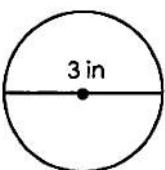
54.9 ft
45 ft
25.6 ft
51.3 ft

$P = 45 + 51.3 + 25.6 + 54.9$
$= 176.8$

$\dfrac{176.8}{50} = 3.536$

© Gina Wilson (All Things Algebra®), 2018

Find the circumference and area of each circle. Use 3.14 for pi.

7.

8ft

$$C = 2\pi 8$$

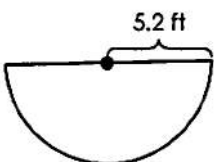$$A = \pi(8)^2$$

8.

3 in

$$C = 2\pi 1.5$$

$$A = \pi(1.5)^2$$

7. $C =$ _50.24 ft_

   $A =$ _200.96 ft²_

8. $C =$ _9.42 in_

   $A =$ _7.065 in²_

9. $C =$ _26.728 ft_

   $A =$ _42.4528 ft²_

10. $C =$ _92.52 mm_

    $A =$ _508.68 mm²_

Find the circumference and area of each semi circle. Use 3.14 for pi.

9.

5.2 ft

$$C = \tfrac{1}{2}(2\pi 5.2) + 10.4$$

$$A = \tfrac{1}{2}\pi(5.2)^2$$

10.

36 mm

$$C = \tfrac{1}{2}(2\pi 18) + 36$$

$$A = \tfrac{1}{2}\pi(18)^2$$

11. Macy has a circular pool with a diameter of 18 feet. If she swims around the pool 4 times, find the distance she will travel.

$$C = 2\pi 9$$
$$= 18(3.14)$$
$$= 56.52$$
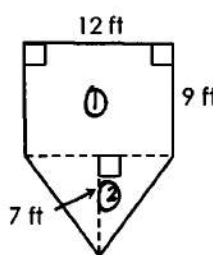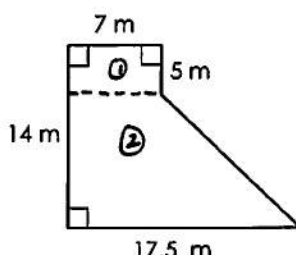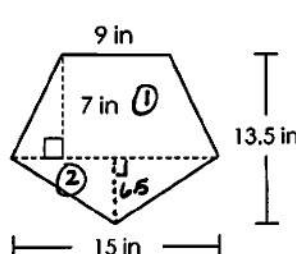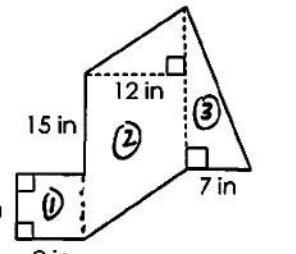
$$56.52(4) = 226.08$$

11. _226.08 ft_

12. _1256 mi²_

12. The maximum distance that the light on a lighthouse can reach is 20 miles. If the light can rotate 360 degrees, find the total area that it can light.

$$A = \pi(20)^2$$
$$= 400(3.14)$$
$$= 1256$$

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
COMPOSITE FIGURE	A figure that can be separated into regions that are basic plane figures.
AREA OF A COMPOSITE FIGURE	**To find the area of a composite figure:** ① Break the figure apart into shapes with areas you can find. (squares, rectangles, parallelograms, triangles, trapezoids, circles, semicircles) ② Find the area of each of these shapes. ③ Find the sum of these areas.
EXAMPLES	**Find the area of each figure. Use 3.14 for pi when necessary.**

1.

12 ft
① 9 ft
7 ft ②

$A_1 = 12(9) = 108$

$A_2 = \frac{1}{2}(12)(7) = 42$

$A = 108 + 42 = \boxed{150 \, ft^2}$

2.

7 m
① 5 m
14 m ②
17.5 m

$A_1 = 7(5) = 35$

$A_2 = \frac{1}{2}(9)(7+17.5) = 110.25$

$A = 35 + 110.25 = \boxed{145.25 \, m^2}$

3.

9 in
7 in ①
13.5 in
② 6.5
15 in

$A_1 = \frac{1}{2}(7)(9+15) = 84$

$A_2 = \frac{1}{2}(6.5)(15) = 48.75$

$A = 84 + 48.75 = \boxed{132.75 \, in^2}$

4.

12 in
15 in ② ③
9 in ①
7 in
9 in

$A_1 = 9^2 = 81$

$A_2 = 12(24) = 288$

$A_3 = \frac{1}{2}(24)(7) = 84$
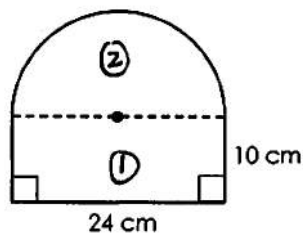
$A = 81 + 288 + 84 = \boxed{453 \, in^2}$

5.
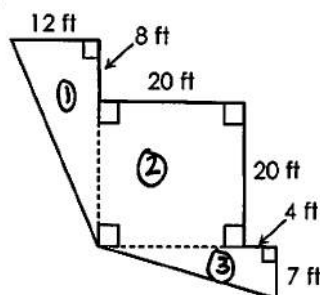
$A_1 = \frac{1}{2}(12)(28) = 168$

$A_2 = 20^2 = 400$

$A_3 = \frac{1}{2}(7)(24) = 84$

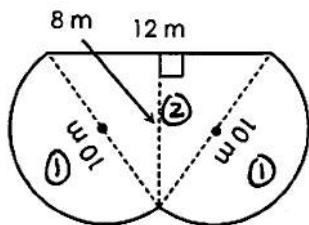$A = 168 + 400 + 84 = \boxed{652 \text{ ft}^2}$

6.

$A_1 = 24(10) = 240$

$A_2 = \frac{1}{2}(3.14)(12)^2 = 226.08$

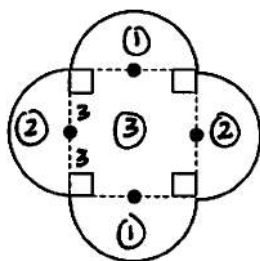$A = 240 + 226.08 = \boxed{466.08 \text{ cm}^2}$

7.

$A_1 = (3.14)(5)^2 = 78.5$

$A_2 = \frac{1}{2}(12)(8) = 48$

$A = 78.5 + 48 = \boxed{126.5 \text{ m}^2}$

8. The perimeter of the square in the figure below is 24 inches.
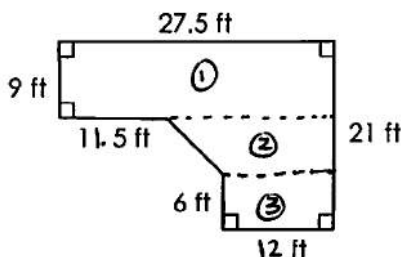

$A_1 = 3.14(3)^2 = 28.26$

$A_2 = 3.14(3)^2 = 28.26$

$A_3 = 6^2 = 36$

$A = 28.26 + 28.26 + 36 = \boxed{92.52 \text{ in}^2}$

APPLICATION

9. Mark is having his driveway paved. A diagram of his driveway is shown below. If the company he is using charges $3.50 per square foot, how much will he pay?

$A_1 = 9(27.5) = 247.5$
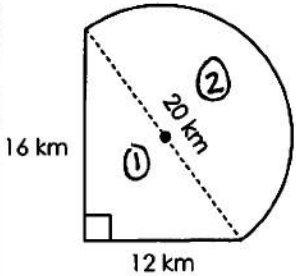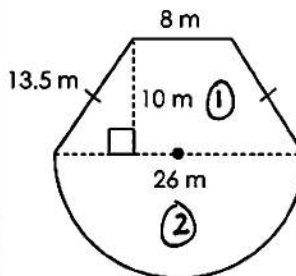
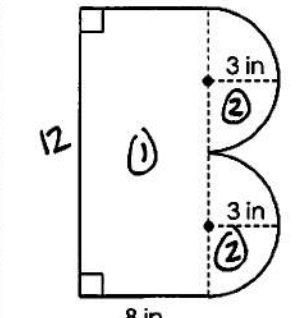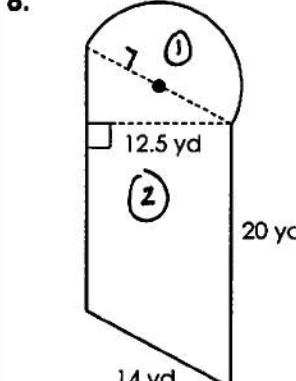$A_2 = \frac{1}{2}(6)(12+16) = 84$

$A_3 = 6(12) = 72$

$A = 247.5 + 84 + 72 = 403.5 \text{ ft}^2$

$403.5(3.50) = \boxed{\$1412.25}$

PERIMETER & AREA OF COMPOSITE FIGURES

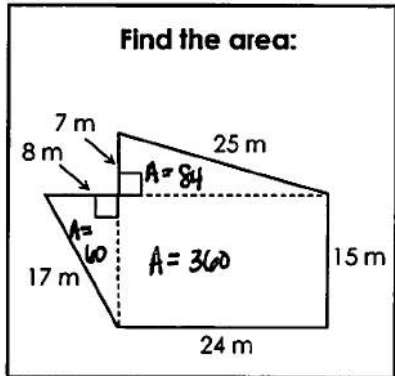Find the perimeter and area of each figure. Use 3.14 for pi when necessary.

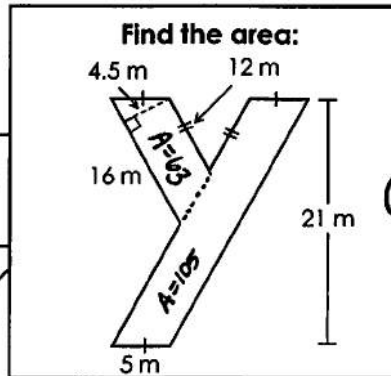|	PERIMETER	AREA
1.	$P = 5 + 2.8 + 7 + 10.2 + 7 + 12$ $= \boxed{44 \text{ mi}}$	$A_1 = \frac{1}{2}(5)(12)$ $= 30$ $A_2 = 9.4(7)$ $= 65.8$ $A = 30 + 65.8 = \boxed{95.8 \text{ mi}^2}$
2.	$P = 2(8) + 13 + 19 + 12$ $= \boxed{60 \text{ cm}}$	$A_1 = \frac{1}{2}(14)(3.9)$ $= 27.3$ $A_2 = \frac{1}{2}(12) \quad (14 + 19)$ $= 198$ $A = 27.3 + 198 = \boxed{225.3 \text{ cm}^2}$
3.	$P = 3(13.4) + 18 + 15$ $= \boxed{73.2 \text{ yd}}$	$A_1 = 11(15)$ $= 165$ $A_2 = \frac{1}{2}(18)(11)$ $= 99$ $A = 165 + 99 = \boxed{264 \text{ yd}^2}$
4.	$P = 2(15) + 3(8) + 27.7$ $= \boxed{81.7 \text{ ft}}$	$A_1 = 15(8)$ $= 120$ $A_2 = \frac{1}{2}(8)(19.7 + 8)$ $= 110.8$ $A = 120 + 110.8 = \boxed{230.8 \text{ ft}^2}$

	PERIMETER	AREA
5. 16 km, 20 km, 12 km	$P = \frac{1}{2} \cdot 2(3.14)(10) +$ $16 + 12$ $= \boxed{59.4 \text{ Km}}$	$A_1 = \frac{1}{2}(12)(16)$ $= 96$ $A_2 = \frac{1}{2}(3.14)(10)^2$ $= 157$ $A = 96 + 157 = \boxed{253 \text{ km}^2}$
6. 8 m, 13.5 m, 10 m, 26 m	$P = \frac{1}{2} \cdot 2(3.14)(13) +$ $8 + 2(13.5)$ $= \boxed{75.82 \text{ m}}$	$A_1 = \frac{1}{2}(10)(8+26)$ $= 170$ $A_2 = \frac{1}{2}(3.14)(13)^2$ $= 265.33$ $A = 170 + 265.33 = \boxed{435.33 \text{ m}^2}$
7. 12, 3 in, 3 in, 8 in	$P = 2(3.14)(3) + 12$ $+ 2(8)$ $= \boxed{46.84 \text{ in}}$	$A_1 = 12(8)$ $= 96$ $A_2 = (3.14)(3)^2$ $= 28.26$ $A = 96 + 28.26 = \boxed{124.26 \text{ in}^2}$
8. 7, 12.5 yd, 20 yd, 14 yd	$P = \frac{1}{2} \cdot 2(3.14)(7)$ $+ 2(20) + 14$ $= \boxed{75.98 \text{ yd}}$	$A_1 = \frac{1}{2}(3.14)(7)^2$ $= 76.93$ $A_2 = 20(12.5)$ $= 250$ $A = 76.93 + 250 = \boxed{326.93 \text{ yd}^2}$

PERIMETER & AREA OF COMPOSITE FIGURES *maze!*

Directions: Find the perimeter or area of each composite figure. Use 3.14 for pi.
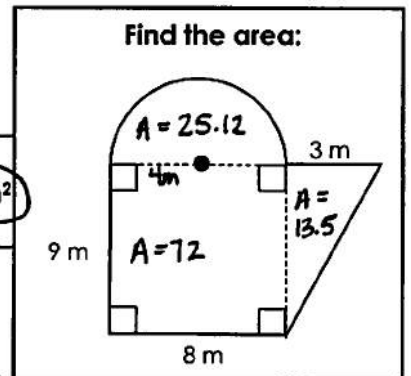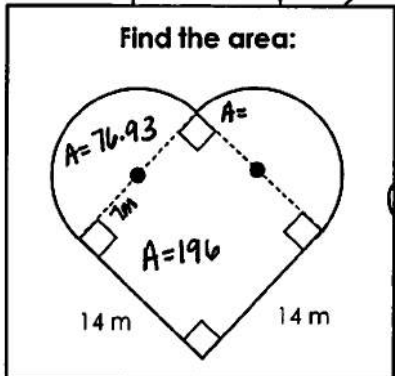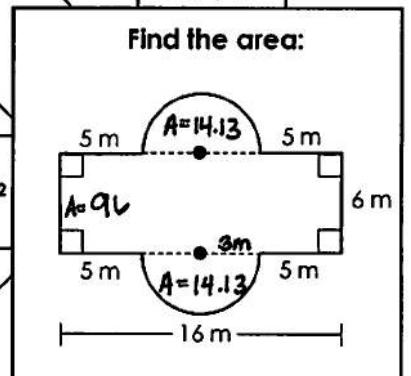Use your solutions to navigate through the maze. **Staple all work to this paper!**

Find the area:

7 m
8 m
25 m
A = 84
A = 60
17 m
A = 360
24 m
15 m

(168 m²)

Find the area:

4.5 m
12 m
A=63
16 m
21 m
A=105
5 m

(110.62 m²)

Find the area:

A = 25.12
3 m
4m
A = 13.5
9 m
A = 72
8 m

(504 m²)   405.62 m   154 m²   134.8 m²   (124.26 m²)

Find the area:

A = 76.93
A =
7m
A = 196
14 m   14 m

(349.86 m²)

End!
☺

94.75 m²

Find the area:

5 m   A=14.13   5 m
A=96   6 m
5 m   3m   5 m
A=14.13
16 m

40.25 m   126.8 m   102.6 m   118.06 m²   (143.5 m²)

Start!

Find the perimeter:

8 m
6 m
10 m
15.7 m

Find the perimeter:

2.8 m   9.5 m
13.6 m

45.4 m   138.7 m

Find the area:

A = 43.5
18.7 m
10   A=100
10 m

(29.7 m)   (84 m)   91.7 m   (76.4 m)   (86.26 m)

Find the perimeter:

9 m
12m
6 m
24 m
13 m   12 m
20 m

72 m

Find the perimeter:

16.2 m
7.5 m
18 m
12 m

80.8 m

Find the perimeter:

28.26
9 m
20 m

© Gina Wilson (All Things Algebra®), 2018

** This is a 2-page document! **

Directions: Find the perimeter and area of each figure. Use 3.14 for pi when necessary.

Figure	Perimeter	Area
1. 18 mm 19 mm ① 14 mm 24 mm ② 20 mm 16 mm	$P = 18 + 19 + 14 + 20 +$ $24 + 19$ $= \boxed{114 \, mm}$	$A_1 = 18(19)$ $= 342$ $A_2 = \frac{1}{2}(32)(16)$ $= 256$ $A = 342 + 256 = \boxed{598 \, mm^2}$
2. 4 mi ① 2.1 mi 8 mi ② 2 mi 3.8 mi ③ 11.9 mi	$P = 4 + 8 + 3.8 + 4 +$ $11.9 + 3(4) + 2 + 2.1$ $= \boxed{47.8 \, mi}$	$A_1 = 4(4.)$ $= 16$ $A_2 = 6.1(4)$ $= 24.4$ $A_3 = 4(11.9) = 47.6$ $A = 16 + 24.4 + 47.6 = \boxed{88 \, mi^2}$
3. 7 yd 8.1 yd ① 8.1 yd 8 yd ②	$P = 8.1 + 8.1 +$ $\frac{1}{2}(2\pi \, 4)$ $P = 8.1 + 8.1 + 12.56$ $= \boxed{28.76 \, yd}$	$A_1 = \frac{1}{2}(8)(7)$ $= 28$ $A_2 = \frac{1}{2} \cdot \pi(4)^2$ $= 25.12$ $A = 28 + 25.12 = \boxed{53.12 \, yd^2}$
4. 24 in 8.4 in 11 in	$P = 2(24) + 4(8.4)$ $= \boxed{81.6 \, in}$	$A_1 = 24(5.5)$ $= 132$ $A_2 = 24(5.5)$ $= 132$ $A = 2(132) = \boxed{264 \, in^2}$

5.

5.7 ft, 6 ft, 4 ft, 8 ft ①, ② 8 ft, 12 ft ③

$P = 5.7 + 4 + 6 + 8$
$\quad + 8 + \frac{1}{2}(2\pi 6)$

$= 5.7 + 4 + 6 + 2(8) +$
18.84

$= \boxed{50.54 \text{ ft}}$

$A_1 = \frac{1}{2}(6)(4+8)$
$\quad = 36$
$A_2 = 6(8) = 48$
$A_3 = \frac{1}{2}\pi(6)^2$
$\quad = 56.52$

$A = 36 + 48 + 56.52 = \boxed{140.52 \text{ ft}^2}$

6.

3 in ②, 3.9 in, 5.8 in, ① 3.5 in ③, 3.5 in, 8.2 in

$P = 3 + 3.9 + 5.8 +$
$\quad 3.5 + 8.2 + \frac{1}{2}(2\pi 1.75)$

$= 3 + 3.9 + 5.8 + 3.5$
$\quad + 8.2 + 5.495$

$= \boxed{29.895 \text{ in}}$

$A_1 = \frac{1}{2}\pi(1.75)^2$
$\quad = 4.808125$
$A_2 = \frac{1}{2}(24)(3)$
$\quad = 3.6$
$A_3 = 8.2(3.5) = 28.7$

$A = \boxed{37.108125 \text{ in}^2}$

7. The zebra enclosure at the zoo needs a new layer of hay throughout the entire enclosure. How many square meters of hay do they need?

① 23 m, 17 m, ②, 30 m, 17 m, ③ 11 m

$A_1 = \frac{1}{2}(11)(17) = 93.5$
$A_2 = 40(30) = 1200$
$A_3 = \frac{1}{2}(11)(17) = 93.5$

$A = \boxed{1387 \text{ m}^2}$

8. Farmer Johnson is putting fencing up around the field used for his cows. How much many yards of fencing will he need?

$P = 60 + 80 +$
$\quad \frac{1}{2}(2\pi 40) + 60$
$\quad + 2(93)$

$= \boxed{511.6 \text{ yd}}$

80 yd, 80 yd, 60 yd, 106 yd, 93 yd

9. Aaron is having rain gutters installed around the perimeter of his roof. How much will he spend if he is charged $3.50 per foot?

9.6 ft, 7.5 ft, 4 ft, 12 ft, 15 ft, 20 ft, 4.5 ft, 15 ft, 2.5 ft
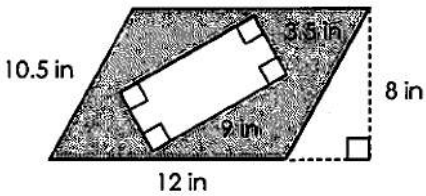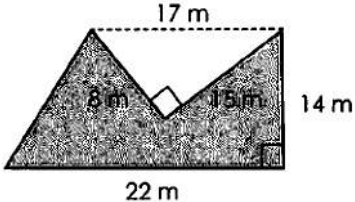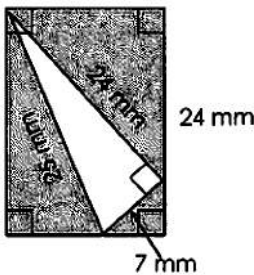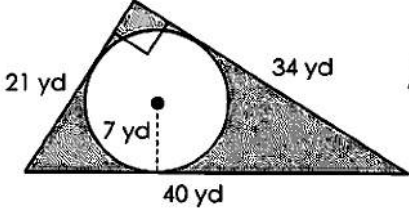
$P = 2(9.6) + 2(15)$
$\quad + 2(4) + 2(2.5)$
$\quad + 2(4.5) + 15$

$= \boxed{86.2 \text{ ft}}$

10. Ashlyn is having new hardwood flooring installed in her living room, kitchen and dining room. If the flooring costs $4.25 per square foot, how much will she spend?

$4.25(136.5)$

$= \boxed{\$580.13}$

6 ft, 10 ft, ①, 8 ft, 4 ft, 13.5 ft, ② 7.5 ft, 10.3 ft, 18 ft

$A_1 = \frac{1}{2}(6)(8) = 24$
$A_2 = \frac{1}{2}(7.5)(12+18) = 112.5$

Name:		Date:
Topic:		Class:

Main Ideas/Questions	Notes/Examples
Area of **SHADED REGIONS**	**To find the area of a shaded region:**
	① Find the area of the entire region.
	② Find the area of the unshaded region(s).
	③ Subtract the area of the unshaded region from the area of the entire region.
EXAMPLES	**Find the area of the shaded region. Use 3.14 for pi when necessary.**

1.

10.5 in · 3.5 in · 8 in · 9 in · 12 in

$A_{outside} = 12(8) = 96$

$A_{inside} = 3.5(9) = 31.5$

$\text{Shaded Area} = 96 - 31.5 = \boxed{64.5 \text{ in}^2}$

2.

17 m · 8 m · 15 m · 14 m · 22 m

$A_{out} = \frac{1}{2}(14)(17+22)$
$= 273$

$A_{in} = \frac{1}{2}(8)(15)$
$= 60$

$SA = 273 - 60 = \boxed{213 \text{ m}^2}$

3.

16 mm · 24 mm · 25 mm · 24 mm · 7 mm

$A_{out} = 16(24)$
$= 384$

$A_{in} = \frac{1}{2}(7)(24)$
$= 84$

$SA = 384 - 84 = \boxed{300 \text{ mm}^2}$

4.

21 yd · 7 yd · 34 yd · 40 yd

$A_{out} = \frac{1}{2}(21)(34)$
$= 357$

$A_{in} = \pi(7)^2$
$= 153.86$

$SA = 357 - 153.86 = \boxed{203.14 \text{ yd}^2}$

5.
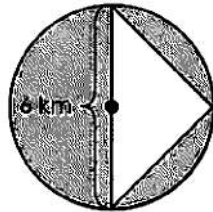
$A_{out} = \pi (3)^2 = 28.26$

$A_{in} = \frac{1}{2}(6)(3) = 9$

$SA = 28.26 - 9$
$= \boxed{19.26 \text{ km}^2}$

6.

14 ft

14 ft
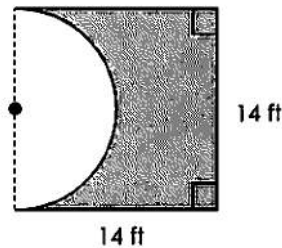
$A_{out} = 14^2 = 196$

$A_{in} = \frac{1}{2}(\pi (7)^2)$
$= 76.93$

$SA = 196 - 76.93 = \boxed{119.07 \text{ ft}^2}$

7.

4 m

12 m
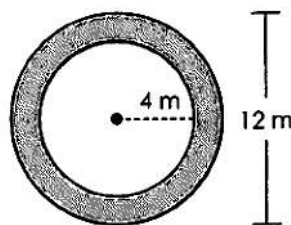
$A_{out} = \pi (6)^2$
$= 113.04$

$A_{in} = \pi (4)^2$
$= 50.24$

$SA = 113.04 - 50.24 = \boxed{62.8 \text{ m}^2}$

8.

10 cm

r=2.5cm
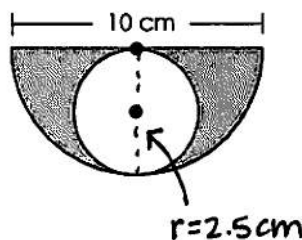
$A_{out} = \frac{1}{2}\pi (5)^2$
$= 39.25$

$A_{in} = \pi (2.5)^2$
$= 19.625$

$SA = 39.25 - 19.625 = \boxed{19.625 \text{ cm}^2}$

APPLICATION

9. A recreation complex is placing grass around a 78-foot by 27-foot tennis court as shown below. If one bag of grass seed covers 200 square feet, how many bags are needed?

4.5 ft

78

27

4.5 ft
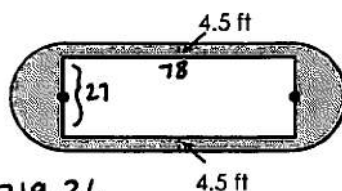
$A_{out} = \pi (18)^2 + 78(36)$
$= 3825.36$

$A_{in} = 78(27)$
$= 2106$

$\frac{1719.36}{200} = 8.6$

$\boxed{9 \text{ bags}}$

$SA = 3825.36 - 2106 = 1719.36 \text{ ft}^2$

** This is a 2-page document! **

Directions: Find the area of the shaded region. Use 3.14 for pi when necessary.

1.

28 ft

10 ft

20 ft
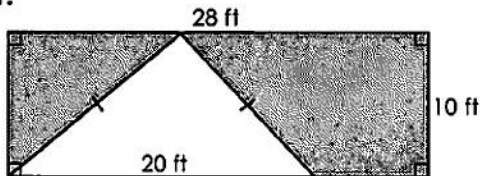
$A_{out} = 28(10) = 280$

$A_{in} = \frac{1}{2}(20)(10) = 100$

$SA = 280 - 100 = \boxed{180 ft^2}$

2.

22 m

10 m
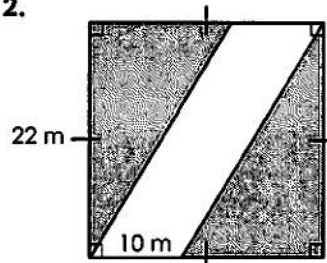
$A_{out} = 22^2 = 484$

$A_{in} = 10(22) = 220$

$SA = 484 - 220 = \boxed{264 m^2}$

3.

10 in

7.5 in

3 in

5 in   5 in
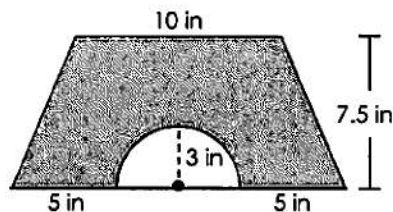
$A_{out} = \frac{1}{2}(7.5)(10+16) = 97.5$

$A_{in} = \frac{1}{2}\pi(3)^2 = 14.13$

$SA = 97.5 - 14.13 = \boxed{83.37 in^2}$

4.

14 mm
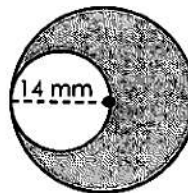
$A_{out} = \pi(14)^2 = 615.44$

$A_{in} = \pi(7)^2 = 153.86$

$SA = 615.44 - 153.86 = \boxed{461.58 mm^2}$

5.

20.2 cm

9.2 cm

4.1 cm

9 cm

8 cm

18 cm
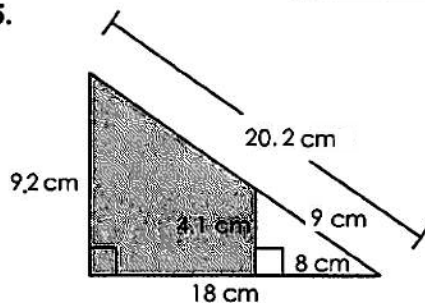
$A_{out} = \frac{1}{2}(9.2)(18) = 82.8$

$A_{in} = \frac{1}{2}(4.1)(8) = 16.4$

$SA = 82.8 - 16.4 = \boxed{66.4 cm^2}$

6.

19 yd

18 yd

6 yd
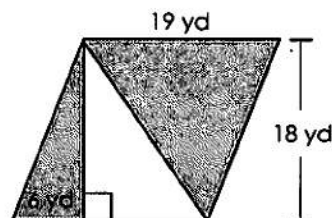
$A_{out} = 19(18) = 342$

$A_{in} = \frac{1}{2}(13)(18) = 117$

$SA = 342 - 117 = \boxed{225 yd^2}$

7.
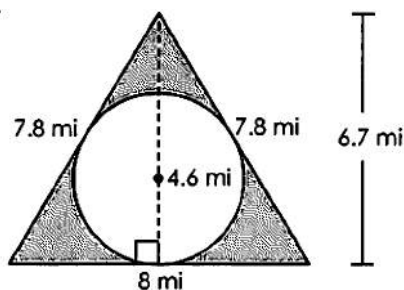
$A_{out} = \frac{1}{2}(6.7)(8)$
$= 26.8$

$A_{in} = \pi(2.3)^2$
$= 16.6106$

$SA = 26.8 - 16.6106 = \boxed{10.1894\ mi^2}$

8.
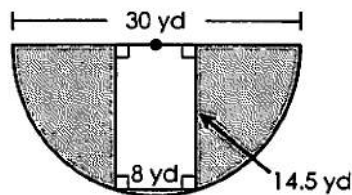
$A_{out} = \frac{1}{2}\pi(15)^2$
$= 353.25$

$A_{in} = 8(14.5) = 116$

$SA = 353.25 - 116 = \boxed{237.25\ yd^2}$

9. Lisa just put down a circular area rug in her dining room. What area of the floor is not covered by the rug?
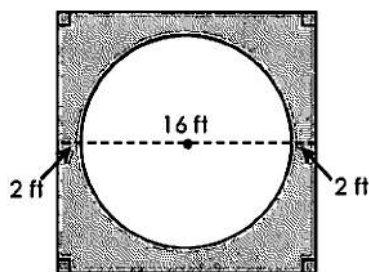
$A_{out} = 20^2 = 400$

$A_{in} = \pi(8)^2 = 200.96$

$SA = 400 - 200.96 = \boxed{199.04\ ft^2}$

10. James has a sidewalk that runs through his flower garden. He needs to put more mulch in the flower garden. If one bag of mulch covers 4 square yards, how many bags of mulch will he need?
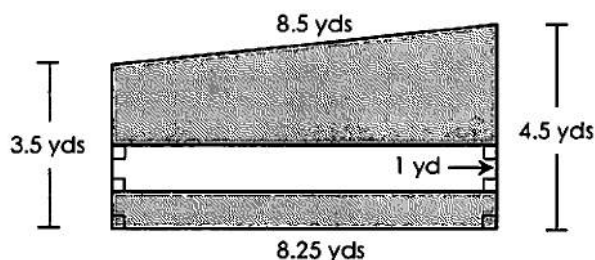
$A_{out} = \frac{1}{2}(8.25)(3.5+4.5)$
$= 33$

$A_{in} = 1(8.25)$
$= 8.25$

$SA = 33 - 8.25 = \boxed{24.75\ yd^2}$

Quiz 7-2: Composite Figures

Find the perimeter and area of each figure. Use 3.14 for pi when necessary.

1.

12 in
6.4 in
①
4.6 in
9 in
②
← 9 in
9 in
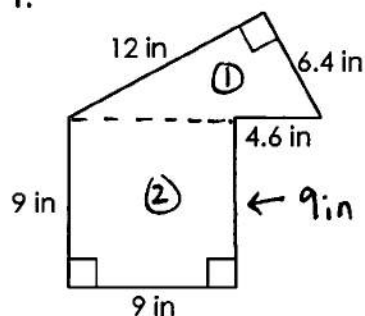
$P = 12 + 6.4 + 4.6 + 3(9)$

$A_1 = \frac{1}{2}(6.4)(12) = 38.4$

$A_2 = 9(9) = 81$

1. $P =$ ___50 in___

$A =$ ___119.4 in^2___

2. $P =$ ___51 m___

$A =$ ___126 m^2___

3. $P =$ ___72.14 yd___

$A =$ ___289.62 yd^2___

4. $P =$ ___124.8 cm___

$A =$ ___524 cm^2___

2.

5.5 m
6 m
① ②
14 m
5.5 m
9 m
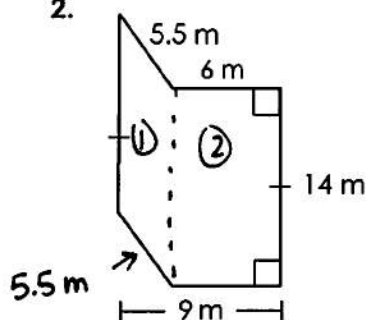
$P = 2(5.5) + 2(6) + 2(14)$

$A_1 = 3(14) = 42$

$A_2 = 14(6) = 84$

3. The diameter of the semicircle below is 12 yards.

22.3 yd
6
6
②
14 yd
6
11 yd
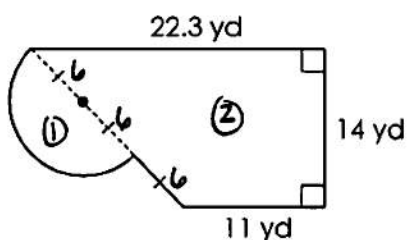
$P = \frac{1}{2}(2\pi 6) + 22.3 + 14 + 11 + 6$

$A_1 = \frac{1}{2}\pi(6)^2 = 56.52$

$A_2 = \frac{1}{2}(14)(11 + 22.3) = 233.1$

4.

20 cm ① ② ①
21 cm
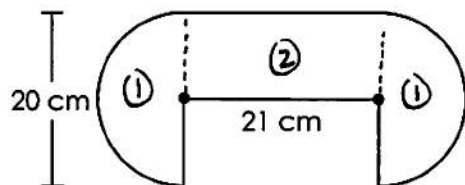
$P = 2\pi 10 + 2(21) + 2(10)$

$A_1 = \pi(10)^2 = 314$

$A_2 = 10(21) = 210$

5. Greg is replacing a countertop in his kitchen with a new granite countertop. The dimensions of the countertop are shown below. If the granite he chose costs $175 per square foot, how much will it cost?

5. **$ 4637.50**
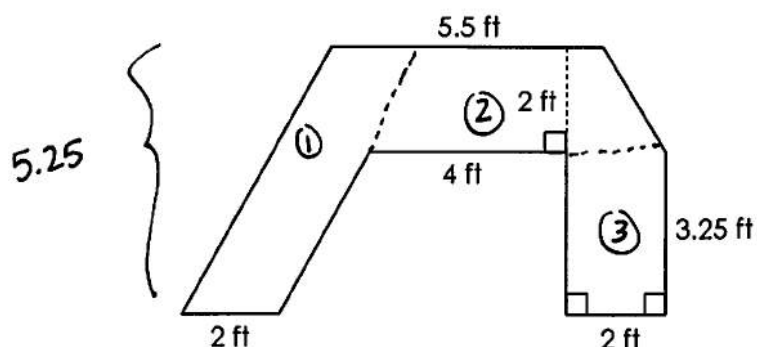
$$A_1 = 2(5.25) = 10.5$$
$$A_2 = \frac{1}{2}(2)(6 + 3.5) = 9.5$$
$$A_3 = 2(3.25) = 6.5$$
$$A = 26.5$$
$$26.5(175) = 4637.5$$

Countertop dimensions: 5.5 ft (top), ② 2 ft, ① , 4 ft, ③ 3.25 ft, 2 ft (bottom left), 2 ft (bottom right), 5.25

Find the area of the shaded region. Use 3.14 for pi.

6.

13 ft
5 ft
14 ft
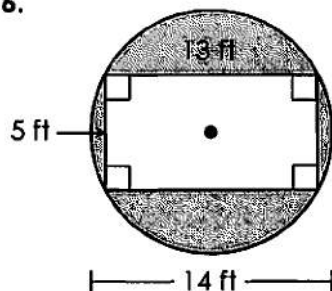
$$A_{out} = \pi (7)^2 = 153.86$$
$$A_{in} = 13(5) = 65$$

6. $A =$ **88.86 ft²**

7. $A =$ **326 cm²**

8. $A =$ **50.88 mm²**

7.

20 cm
12 cm   12 cm
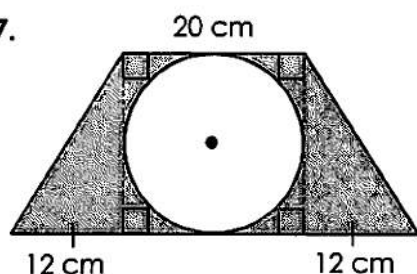
$$A_{out} = \frac{1}{2}(20)(20 + 44) = 640$$
$$A_{in} = \pi (10)^2 = 314$$

8.

① ②
15 mm
11
8 mm
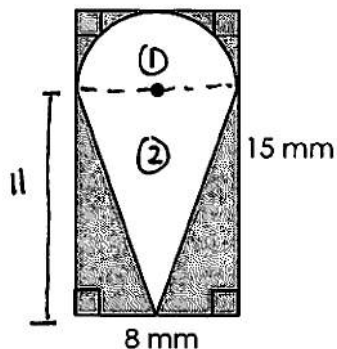
$$A_{out} = 15(8) = 120$$
$$A_{in_1} = \frac{1}{2}\pi (4)^2 = 25.12$$
$$A_{in_2} = \frac{1}{2}(8)(11) = 44$$
$$\left.\right\} 69.12$$
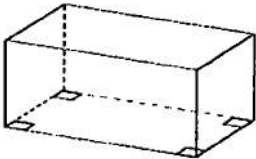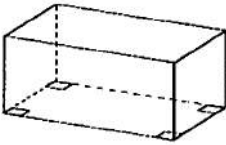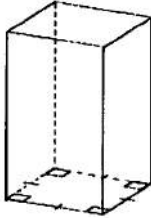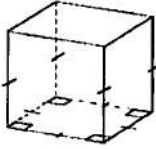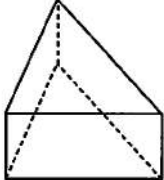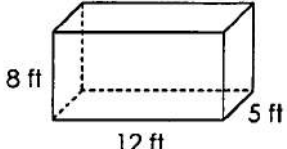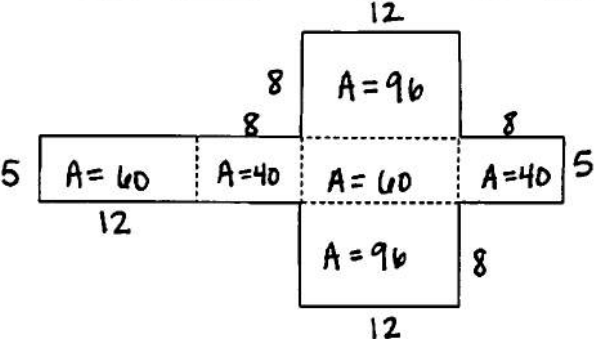
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
What Is a **PRISM?**	• A **prism** is a 3-dimensional figure with two congruent and parallel faces, called ___bases___. • The other sides are called ___lateral___ ___faces___.

	Prisms are named by their bases. Classify each common prism:

Types of PRISMS

Rectangular Prism	Square Prism	Cube	Triangular Prism

SURFACE AREA	The surface area of a prism is the sum of the area of the bases and lateral faces

NETS	A net is a 2-dimensional composite figure that shows each face of a 3-dimensional figure. Think of a net like "unfolding" a 3D figure. Nets are useful in finding the surface area of a prism.

SURFACE AREA of a Rectangular Prism **WITH NETS:** →	Label the dimensions on the net using the dimensions given on the prism. Then, find the surface area of the prism using the net. 1. 8 ft 5 ft 12 ft 12 8 A=96 8 8 5 A=60 A=40 A=60 A=40 5 12 A=96 8 12 $SA = 60 + 40 + 96 + 60 + 96 + 40$ $= \boxed{392 \ ft^2}$

2.

2.5 m, 16 m, 6 m

Net labels: A=15 (top and bottom), A=40, A=96, A=40, A=96, with dimensions 6, 16, 2.5
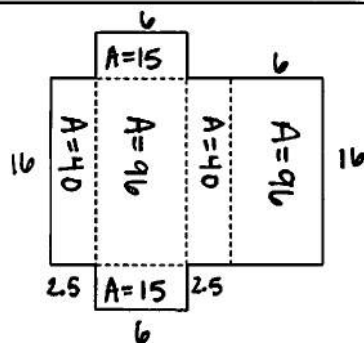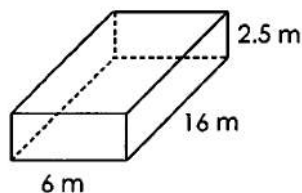
$$SA = 40 + 15 + 96 + 15 + 40 + 96 = \boxed{302 \, m^2}$$

SURFACE AREA
of a Rectangular Prism

WITH A FORMULA: →

Label the net using *l*, *w*, and *h*. Use the area of each section to write a simplified formula for the surface area of a rectangular prism.

Net labels: $A = \ell h$, $A = \ell w$, $A = wh$, $A = \ell w$, $A = wh$, $A = \ell h$
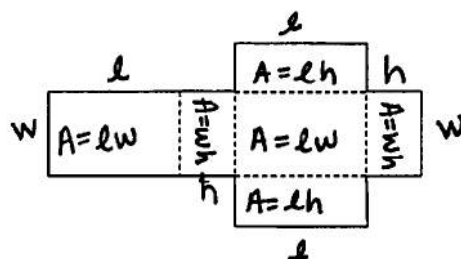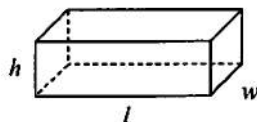
Formula: $\boxed{SA = 2(\ell w) + 2(\ell h) + 2(wh)}$

Find the surface area of each rectangular prism using the formula above.

3.

18 ft, 5 ft, 3 ft
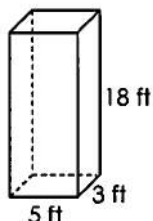
$$SA = 2(5)(3) + 2(3)(18) + 2(5)(18)$$
$$= 30 + 108 + 180$$
$$= \boxed{318 \, ft^2}$$

4.

1.5 cm, 8 cm, 32 cm
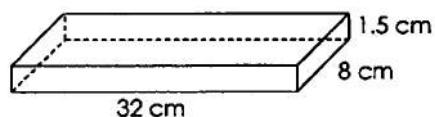
$$SA = 2(32)(8) + 2(32)(1.5) + 2(8)(1.5)$$
$$= 512 + 96 + 24$$
$$= \boxed{632 \, cm^2}$$

5.

7 in, 7 in, 7 in
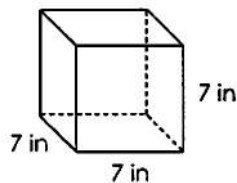
$$SA = 2(7)(7) + 2(7)(7) + 2(7)(7)$$
$$= 6(49)$$
$$= \boxed{294 \, in^2}$$

6.

17.4 m, 6.5 m, 11 m
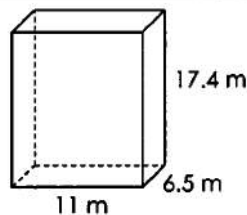
$$SA = 2(11)(6.5) + 2(11)(17.4) + 2(6.5)(17.4)$$
$$= 143 + 382.8 + 226.2$$
$$= \boxed{752 \, m^2}$$

Directions: Find the surface area of the rectangular prism using the net.

1.

5 in
5 in
6 in
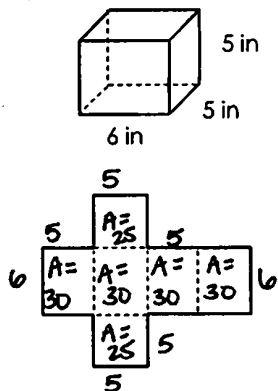
$SA = 30 + 25 + 30$
$+ 25 + 30 + 30$

$SA = 170 in^2$

5
5 | A=25 | 5
6 | A=30 | A=30 | A=30 | A=30 | 6
A=25 | 5
5

2.

40 cm
13.2 cm
3 cm
40

A = 528   13.2
A = 120   A=39.6
A = 528   13.2
A=39.6   A = 120   3
13.2
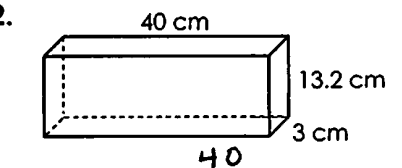
$SA = 528 +$
$120 + 528 +$
$120 + 39.6 +$
39.6

3 | $SA = 1375.2 cm^2$

Directions: Draw a net or use a formula to find the surface area of the rectangular prism.

3.

12 ft
12 ft
12 ft
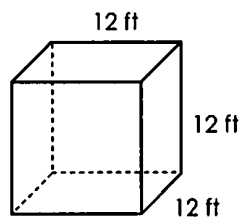
$SA = 2(12)(12) + 2(12)(12) +$
$2(12)(12)$
$= 6(144)$ $= 864 ft^2$

4.

17 cm
17 cm
25 cm
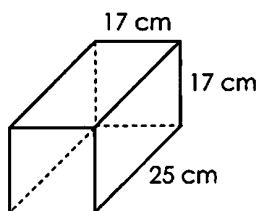
$SA = 2(17)(17) + 2(17)(25) + 2(17)(25)$
$= 578 + 850 + 850$ $= 2278 cm^2$

5.

8.2 in
2 in
3.4 in
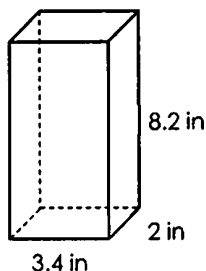
$SA = 2(3.4)(2) + 2(3.4)(8.2)$
$+ 2(2)(8.2)$

$= 13.6 + 55.76 + 32.8$

$= 102.16 in^2$

6.

30 mm
12 mm
10 mm
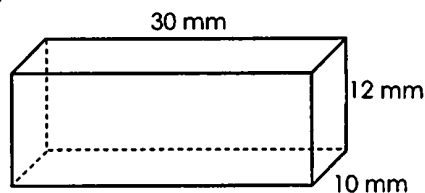
$SA = 2(30)(12) + 2(30)(10) + 2(12)(10)$
$= 720 + 600 + 240$ $= 1560 ft^2$

7.

8 yd
2 yd
20 yd
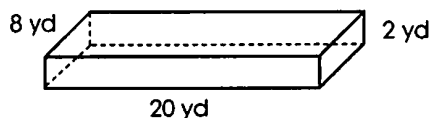
$SA = 2(20)(8) + 2(20)(2) + 2(8)(2)$
$= 320 + 80 + 32$
$= 432 yd^2$

8.
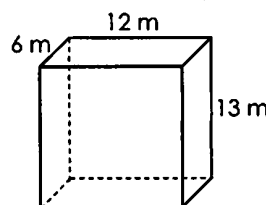
6 m
12 m
13 m

$SA = 2(12)(13) + 2(12)(6) + 2(13)(12)$
$= 312 + 144 + 156$ $= 612 m^2$

© Gina Wilson (All Things Algebra®, LLC), 2018

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
SURFACE AREA of a Triangular Prism	• A **triangular prism** has _triangular_ bases and _rectangular_ lateral faces. • To find the surface area of a triangular prism, find the sum of the area of the bases and the lateral faces.
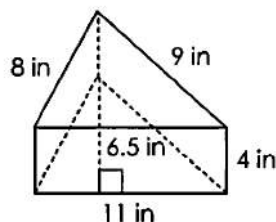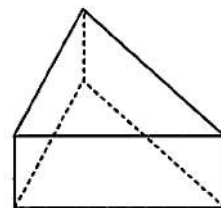
Use the net to find the surface area of each triangular prism to the left.

1.

8 in   9 in
6.5 in   4 in
11 in

A = 35.75
6.5
11
A = 32   A = 44   A = 36
8   9
4   4
A = 35.75
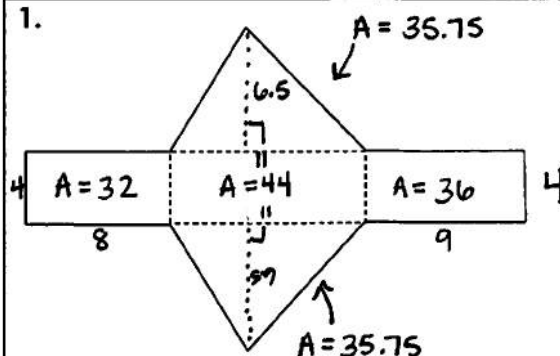
$SA = 32 + 44 + 36 + 2(35.75)$

$SA = 183.5 \text{ in}^2$

2.

12.8 yd
6 yd
8 yd   10 yd

8   10
A = 40
A = 48   A = 76.8   A = 60
12.8
8   10
A = 40
8   10
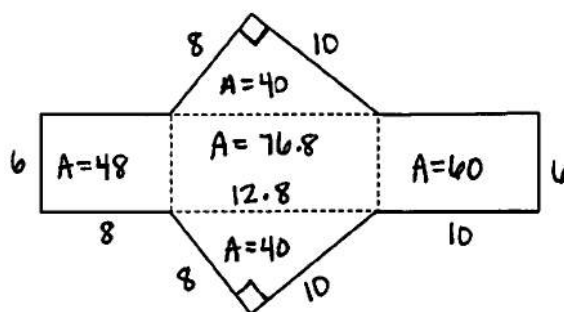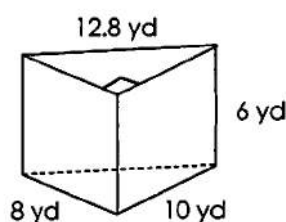
$SA = 48 + 76.8 + 60 + 2(40)$

$SA = \boxed{264.8 \text{ yd}^2}$

3.

9 km   5 km
5 km
7 km   3.6 km

9
A = 45   5
A = 12.6   A = 12.6
3.6   7   A = 63   7   3.6
A = 45   5
9

$SA = 45 + 63 + 45 + 2(12.6)$

$SA = \boxed{178.2 \text{ km}^2}$

© Gina Wilson (All Things Algebra®), 2018

4.

10 cm, 15 cm, 12 cm, 9 cm

Net labels: 10, A=150, 15, A=54, A=120, 12, A=54, 9, A=90, 9, 10
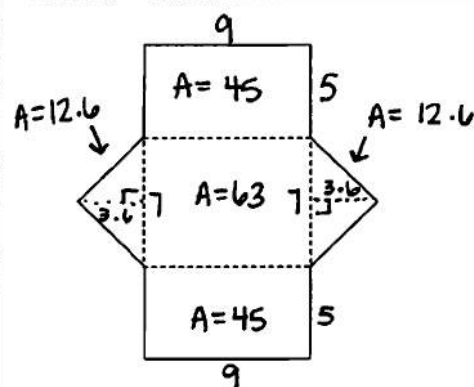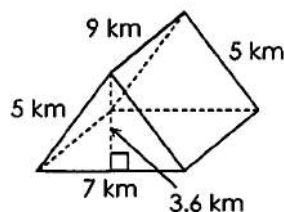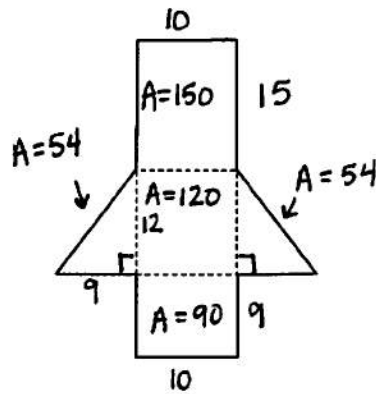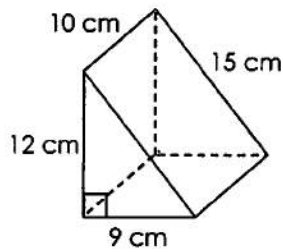
$SA = 150 + 120 + 90$
$\qquad + 2(54)$

$= 468 \text{ cm}^2$

5.
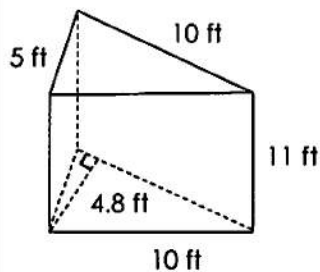
Without a net, find the surface area of each triangular prism by finding the area of the bases and lateral faces.

5 ft, 10 ft, 11 ft, 4.8 ft, 10 ft

Area of Bases:	Area of Lateral Faces:
$A = \frac{1}{2}(10)(4.8)$ $= 24$	$A_1 = 10(11) = 110$ $A_2 = 10(11) = 110$ $A_3 = 5(11) = 55$
$2(24) = 48$	

Total Surface Area: $48 + 110 + 110 + 55 = \boxed{323 \text{ ft}^2}$

6.
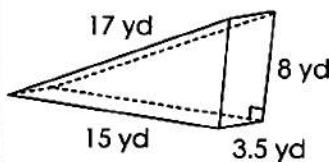
17 yd, 8 yd, 15 yd, 3.5 yd

Area of Bases:	Area of Lateral Faces:
$A = \frac{1}{2}(15)(8)$ $= 60$	$A_1 = 3.5(8) = 28$ $A_2 = 15(3.5) = 52.5$ $A_3 = 17(3.5) = 59.5$
$2(60) = 120$	

Total Surface Area: $120 + 28 + 52.5 + 59.5 = \boxed{260 \text{ yd}^2}$

7.

20 m, 18 m, 18 m, 17 m, 12 m
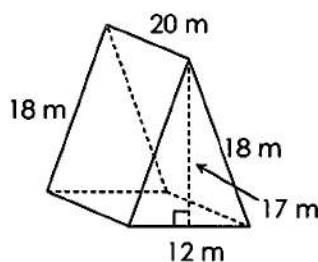
Draw a net or organize your work to find the surface area.

Bases:
$A = \frac{1}{2}(12)(17)$
$= 102$
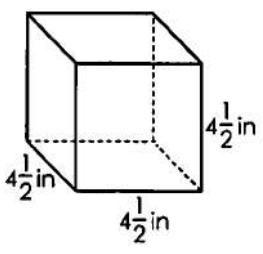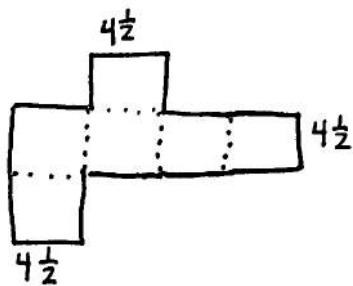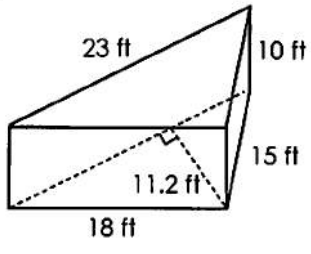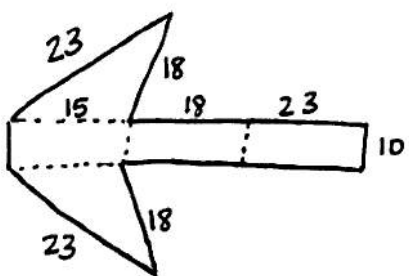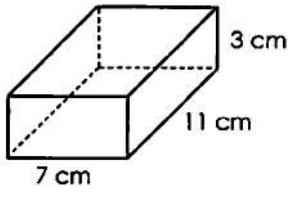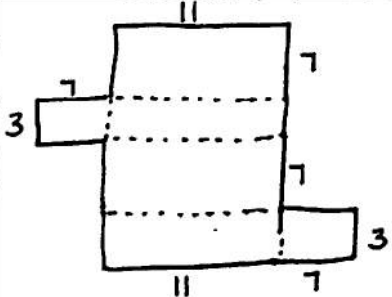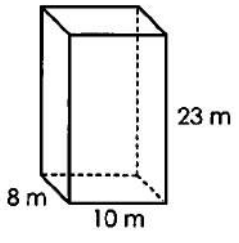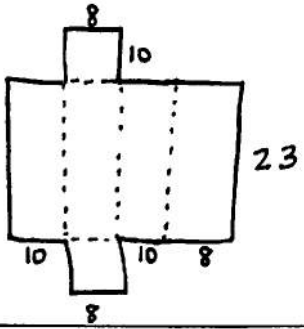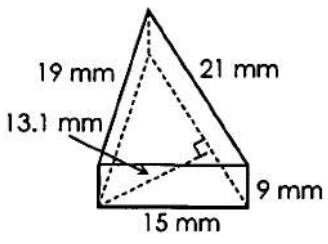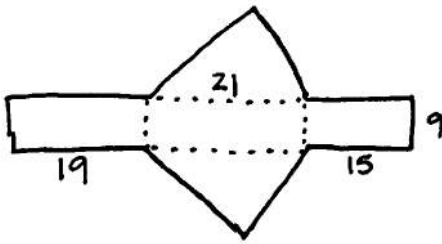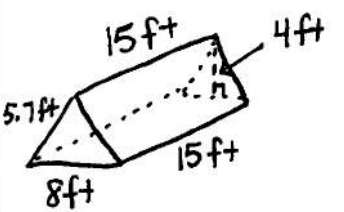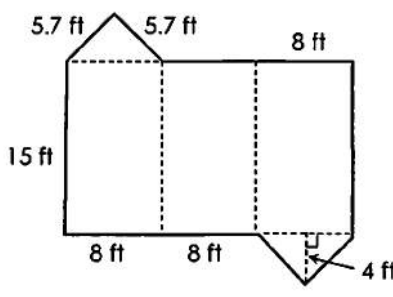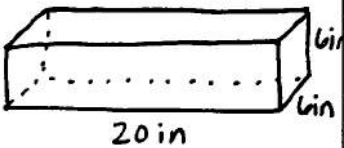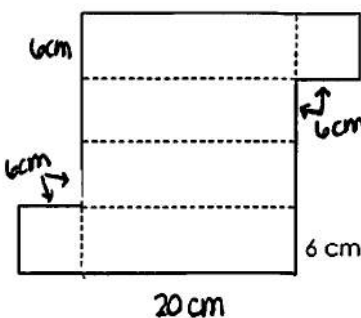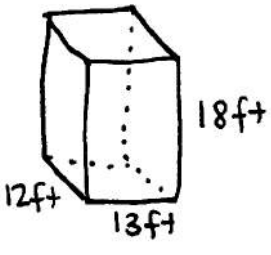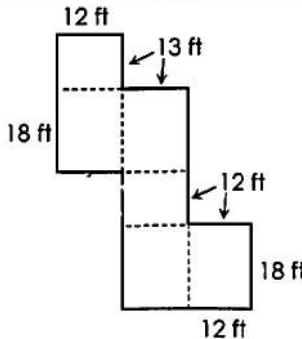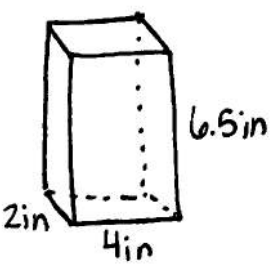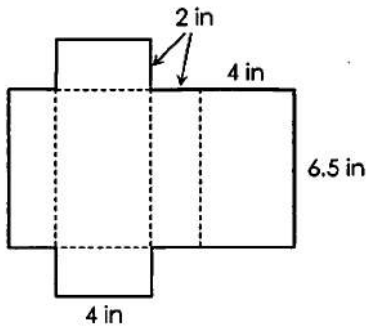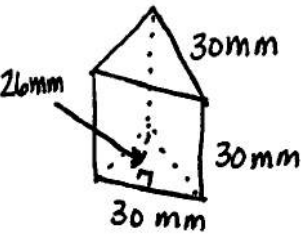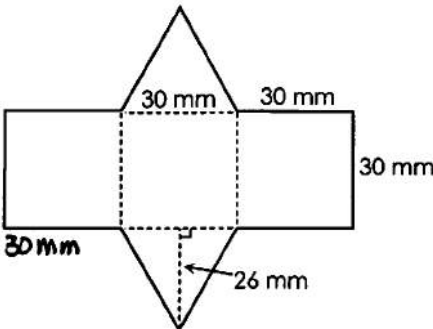
$2(102) = 204$

Lateral:
$A_1 = 20(18) = 360$
$A_2 = 20(18) = 360$
$A_3 = 20(12) = 240$

$SA = 204 + 360 + 360 + 240 = \boxed{1164 \text{ m}^2}$

🌸 🌸 🌸 SURFACE AREA WiTH NETS 🌸 🌸 🌸

Directions: Complete the table by drawing in either the net or prism, then find the surface area for each prism.

PRISM	NET	SURFACE AREA
1		$SA = 2(4.5)(4.5) +$ $2(4.5)(4.5) +$ $2(4.5)(4.5)$ $= 6(20.25)$ $\boxed{= 121.5 \, in^2}$
2		B: $A = \frac{1}{2}(23)(11.2) = 128.8$ $2(128.8) = 257.6$ $A_1 = 15(10) = 150$ $A_2 = 18(10) = 180$ $A_3 = 23(10) = 230$ $SA = \boxed{817.6 \, ft^2}$
3		$SA = 2(11)(7) + 2(3)(7)$ $+ 2(11)(3)$ $= 154 + 42 + 66$ $= \boxed{262 cm^2}$
4		$SA = 2(8)(10) + 2(10)(23)$ $+ 2(8)(23)$ $= 160 + 460 + 368$ $= \boxed{988 \, m^2}$
5		B: $A = \frac{1}{2}(21)(13.1) = 137.55$ $2(137.55) = 275.1$ $A_1 = 15(9) = 135$ $A_2 = 21(9) = 189$ $A_3 = 19(9) = 171$ $SA = \boxed{770.1 \, mm^2}$

PRISM	NET	SURFACE AREA

6

15 ft, 4 ft, 5.7 ft, 5.7ft, 15 ft, 8ft, 8ft

Net: 5.7 ft, 5.7 ft, 8 ft, 15 ft, 8 ft, 8 ft, 4 ft

$B: A = \frac{1}{2}(4)(8) = 16$

$2(16) = 32$

$A_1 = 15(8) = 120$

$A_2 = 8(15) = 120$

$A_3 = 8(15) = 120$

$SA = \boxed{392 \, ft^2}$

7

6in, 6in, 20 in

Net: 6cm, 6cm, 6cm, 6 cm, 20 cm

$SA = 2(6)(6) + 2(6)(20) + 2(6)(20)$

$= 72 + 240 + 240$

$= \boxed{552 \, cm^2}$

8

18ft, 12ft, 13ft

Net: 12 ft, 13 ft, 18 ft, 12 ft, 18 ft, 12 ft

$SA = 2(12)(13) + 2(12)(18) + 2(13)(18)$

$= 312 + 432 + 468$

$= \boxed{1212 \, ft^2}$

9

6.5in, 2in, 4in

Net: 2 in, 4 in, 6.5 in, 4 in

$SA = 2(2)(4) + 2(2)(6.5) + 2(4)(6.5)$

$= 16 + 26 + 52$

$= \boxed{94 \, in^2}$

10

30mm, 26mm, 30mm, 30 mm

Net: 30 mm, 30 mm, 30 mm, 30mm, 26 mm

$B: A = \frac{1}{2}(30)(26) = 390$

$2(390) = 780$

$A_1 = 30(30) = 900$

$A_2 = 30(30) = 900$

$A_3 = 30(30) = 900$

$SA = \boxed{3480 \, mm^2}$
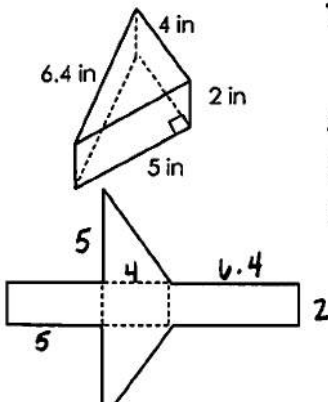
Directions: Find the surface area of the triangular prism using the net.

1.

4 in, 6.4 in, 2 in, 5 in, 5, 4, 6.4, 2, 5

B: $A = \frac{1}{2}(5)(4) = 10$
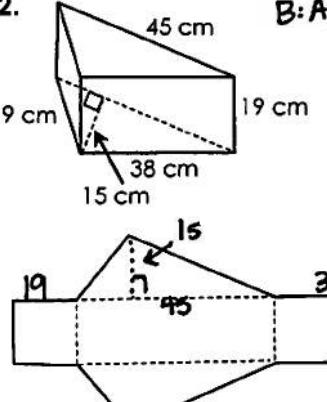
$2(10) = 20$

$A_1 = 2(5) = 10$

$A_2 = 2(4) = 8$

$A_3 = 2(6.4) = 12.8$

$\boxed{SA = 50.8 \text{ in}^2}$

2.

45 cm, 19 cm, 19 cm, 38 cm, 15 cm, 15, 19, 45, 38, 19

B: $A = \frac{1}{2}(45)(15) = 337.5$

$2(337.5) = 675$
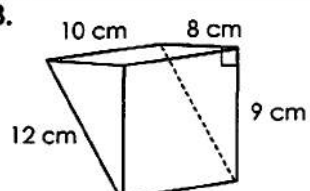
$A_1 = 38(19) = 722$

$A_2 = 45(19) = 855$

$A_3 = 19(19) = 361$

$\boxed{SA = 2613 \text{ cm}^2}$

Directions: Find the surface area of the triangular prisms below. Use a net if necessary.

3.

10 cm, 8 cm, 9 cm, 12 cm

B: $A = \frac{1}{2}(8)(9) = 36$
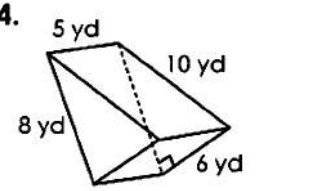
$2(36) = 72$

$A_1 = 9(10) = 90$

$A_2 = 8(10) = 80$

$A_3 = 12(10) = 120$

$\boxed{SA = 362 \text{ cm}^2}$

4.

5 yd, 10 yd, 8 yd, 6 yd

B: $A = \frac{1}{2}(8)(6) = 24$
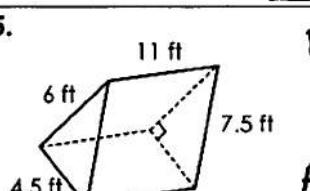
$2(24) = 48$

$A_1 = 5(10) = 50$

$A_2 = 5(6) = 30$

$A_3 = 5(8) = 40$

$\boxed{SA = 168 \text{ yd}^2}$

5.

11 ft, 6 ft, 7.5 ft, 4.5 ft

B: $A = \frac{1}{2}(4.5)(6) = 13.5$
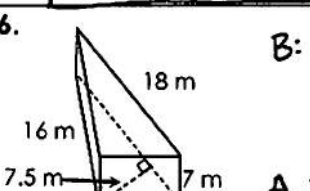
$2(13.5) = 27$

$A_1 = 11(7.5) = 82.5$

$A_2 = 11(6) = 66$

$A_3 = 11(4.5) = 49.5$

$\boxed{SA = 225 \text{ ft}^2}$

6.

18 m, 16 m, 7.5 m, 7 m, 11 m

B: $A = \frac{1}{2}(7.5)(18) = 67.5$
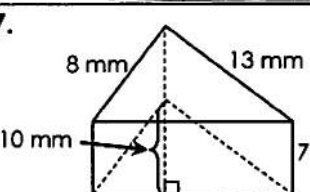
$2(67.5) = 135$

$A_1 = 11(7) = 77$

$A_2 = 16(7) = 112$

$A_3 = 18(7) = 126$

$\boxed{SA = 450 \text{ m}^2}$

7.

8 mm, 13 mm, 10 mm, 7 mm, 20 mm

B: $A = \frac{1}{2}(20)(10) = 100$
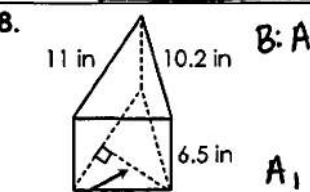
$2(100) = 200$

$A_1 = 20(7) = 140$

$A_2 = 13(7) = 91$

$A_3 = 8(7) = 56$

$\boxed{SA = 487 \text{ mm}^2}$

8.

11 in, 10.2 in, 6.5 in, 6 in, 7 in
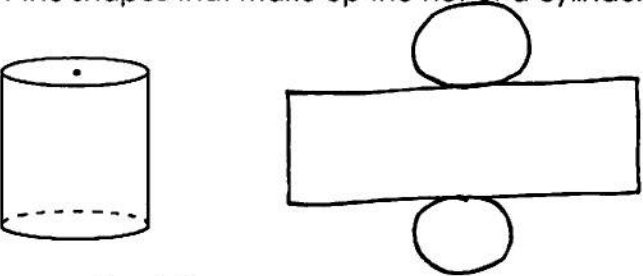
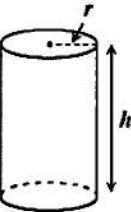B: $A = \frac{1}{2}(11)(6) = 33$

$33(2) = 66$
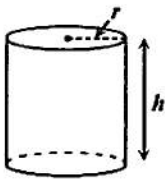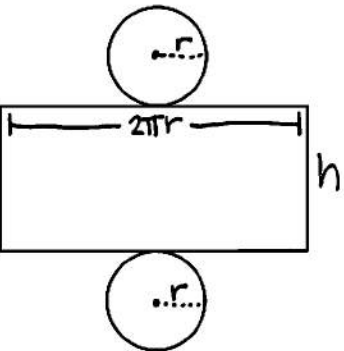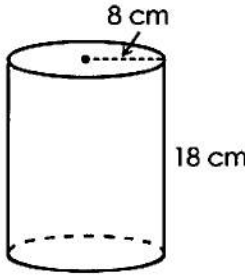
$A_1 = 10.2(6.5) = 66.3$

$A_2 = 11(6.5) = 71.5$

$A_3 = 7(6.5) = 45.5$

$\boxed{SA = 249.3 \text{ in}^2}$

Name:		Date:	
Topic:		Class:	

Main Ideas/Questions	Notes/Examples
What Is a CYLINDER?	A cylinder is a prism with circular bases.
THE NET of a Cylinder	Think about the shapes that make up the net of a cylinder. Draw the net. ➤ The bases are __circles__ and the lateral surface is a __rectangle__.
SURFACE AREA of a Cylinder FORMULA	The surface area of a cylinder is the sum of the areas of the bases and lateral surface. Label the dimensions on the net below, then use the net to develop a formula for the surface area. **What is the area of the bases?** $A = 2 \cdot \pi r^2$ **What is the area of the lateral surface?** $A = 2\pi r \cdot h$ **Formula for the surface area of a cylinder:** $SA = 2\pi r^2 + 2\pi rh$
EXAMPLES	Find the surface area of each cylinder. Use 3.14 for pi. 1. 8 cm 18 cm Bases $A = 2\pi (8)^2$ $= 128(3.14) = 401.92$ Lat: $A = 2\pi (8)(18)$ $= 288(3.14) = 904.32$ $SA = 401.92 + 904.32 = \boxed{1306.24 \text{ cm}^2}$

2.

14 ft, 3 ft
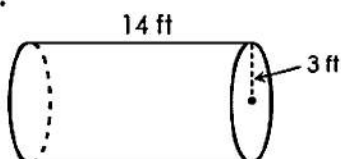
Base: $A = 2\pi(3)^2$
$= 18(3.14) = 56.52$

Lat: $A = 2\pi(3)(14)$
$= 84(3.14) = 263.76$
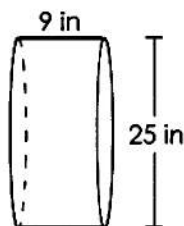
$SA = 56.52 + 263.76 = \boxed{320.28 \, ft^2}$

3.

14 mm, 4 mm
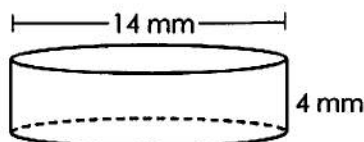
$SA = 2\pi(7)^2 + 2\pi(7)(4)$
$= 98(3.14) + 56(3.14)$
$= 307.72 + 175.84$
$= \boxed{483.56 \, mm^2}$

4.

7 m, 9 m
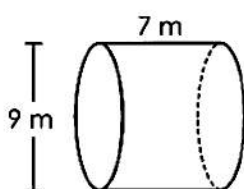
$SA = 2\pi(4.5)^2 + 2\pi(4.5)(7)$
$= 40.5(3.14) + 63(3.14)$
$= 127.17 + 197.82$
$= \boxed{324.99 \, m^2}$

5.

9 in, 25 in

$SA = 2\pi(12.5)^2 + 2\pi(12.5)(9)$
$= 312.5(3.14) + 225(3.14)$
$= 981.25 + 706.5$
$= \boxed{1687.75 \, in^2}$

APPLICATION

6. A tennis ball company packages three tennis balls in a cylindrical-shaped plastic container as shown below. If the diameter of each tennis ball is 2.6 inches, what is the minimum amount of plastic needed to make the container?

2.6 cm, 7.8 cm
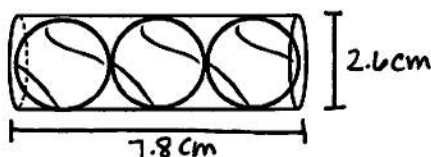
$SA = 2\pi(1.3)^2 + 2\pi(1.3)(7.8)$
$= 3.38(3.14) + 20.28(3.14)$
$= 10.6132 + 63.6792$
$= \boxed{74.2924 \, cm^2}$

Surface Area of Prisms & Cylinders Maze!

Directions: Find the surface area of each prism or cylinder. Use 3.14 for pi when necessary. Use your solutions to navigate through the maze. Staple all work to this paper!

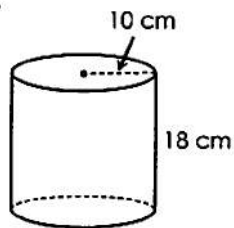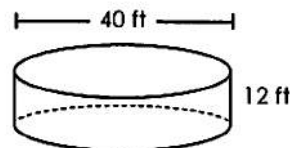**Directions:** Find the surface area of each cylinder. Use 3.14 for pi.

1.

10 cm

18 cm
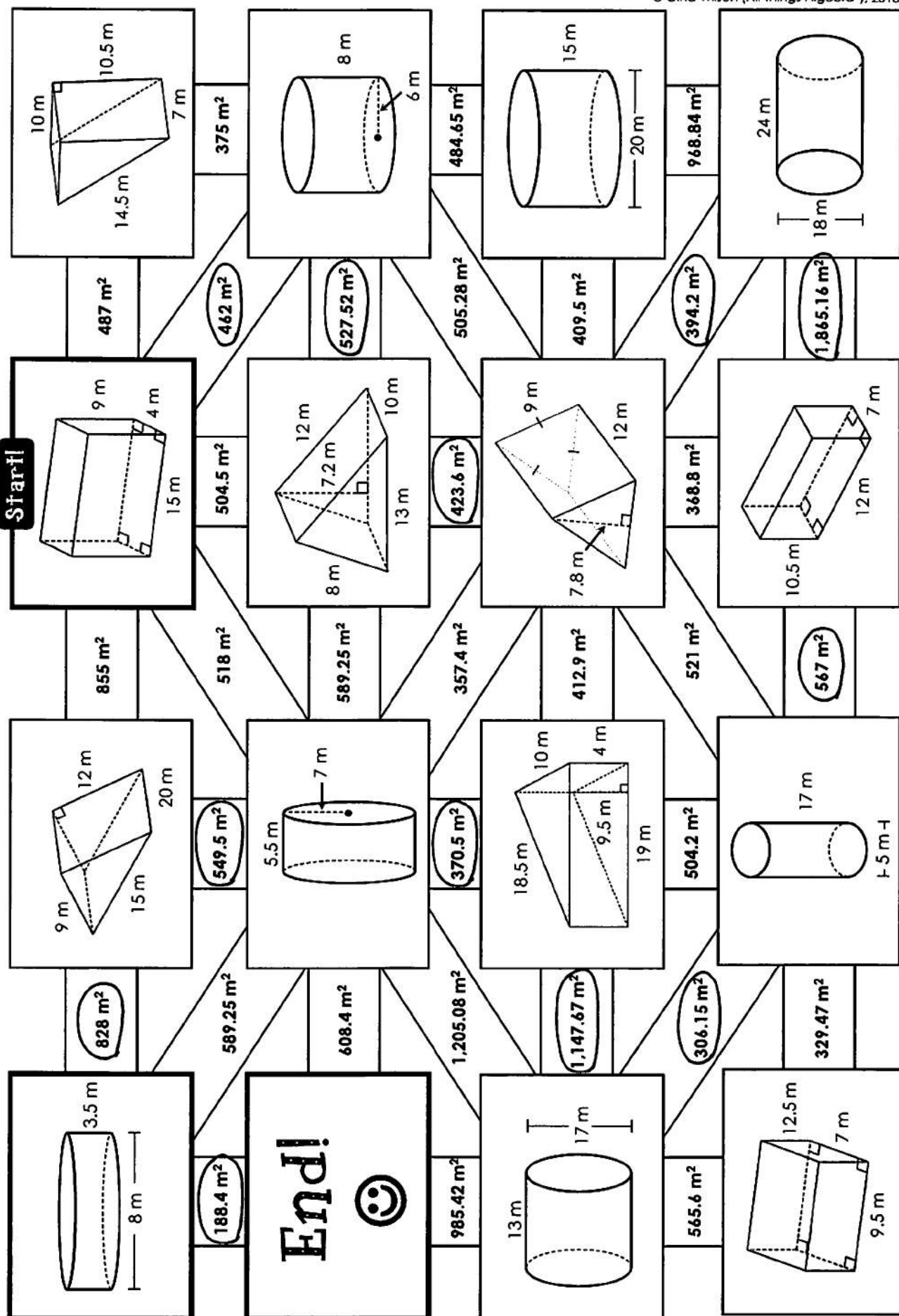
$SA = 2\pi(10)^2 + 2\pi(10)(18)$

$= 200(3.14) + 360(3.14)$

$= 628 + 1130.4$

$= \boxed{1758.4 \text{ cm}^2}$

2.

40 ft

12 ft

$SA = 2\pi(20)^2 + 2\pi(20)(12)$

$= 800(3.14) + 480(3.14)$

$= 2512 + 1507.2$

$= \boxed{4019.2 \text{ ft}^2}$

3.

14 in

5 in
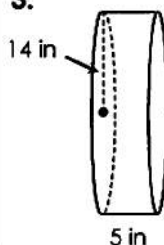
$SA = 2\pi(14)^2 + 2\pi(14)(5)$

$= 392(3.14) + 140(3.14)$

$= 1230.88 + 439.6$

$= \boxed{1670.48 \text{ in}^2}$

4.

9 m

6 m
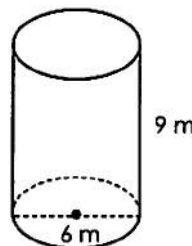
$SA = 2\pi(3)^2 + 2\pi(3)(9)$

$= 18(3.14) + 54(3.14)$

$= 56.52 + 169.56$

$= \boxed{226.08 \text{ m}^2}$

5.

50 cm

13 cm
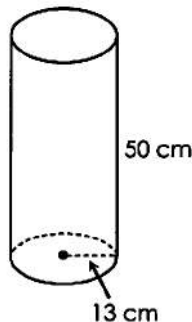
$SA = 2\pi(13)^2 + 2\pi(13)(50)$

$= 338(3.14) + 1300(3.14)$

$= 1061.32 + 4082$

$= \boxed{5143.32 \text{ cm}^2}$

6.

21 mm

30 mm
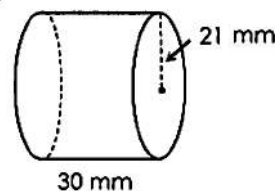
$SA = 2\pi(21)^2 + 2\pi(21)(30)$

$= 882(3.14) + 1260(3.14)$

$= 2769.48 + 3956.4$

$= \boxed{6725.88 \text{ mm}^2}$

7.

52 ft

24 ft

$SA = 2\pi(26)^2 + 2\pi(26)(24)$
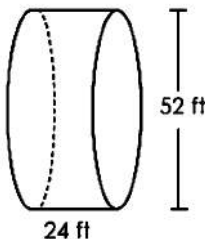
$= 1352(3.14) + 1248(3.14)$

$= 4245.28 + 3918.72$

$= \boxed{8164 \text{ ft}^2}$

8.

7 yd
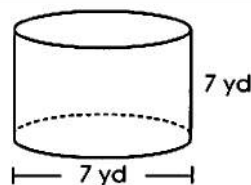
7 yd

$SA = 2\pi(3.5)^2 + 2\pi(3.5)(7)$

$= 24.5(3.14) + 49(3.14)$

$= 76.93 + 153.86$

$= \boxed{230.79 \text{ yd}^2}$

Name:	Date:
Topic:	Class:

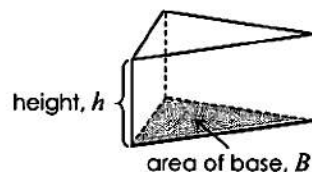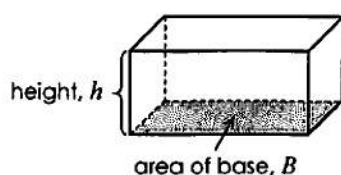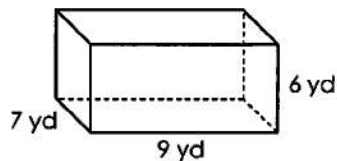| Main Ideas/Questions	Notes/Examples
VOLUME	Volume is the amount of space that a 3-dimensional figure takes up.
VOLUME of Prisms	The volume of a prism is the __product__ of the __area__ of the __base__ and __height__ of the prism. height, h area of base, B height, h area of base, B **Formula:** $V = B \cdot h$

Find the volume of each prism.

Rectangular Prism EXAMPLES

1.

6 yd
7 yd
9 yd

$B = 7(9) = 63$

$V = 63(6)$

$= 378 \text{ yd}^3$

2.

21 mm
8 mm
3.2 mm

$B = 21(3.2)$

$V = 67.2(8)$

$= 537.6 \text{ mm}^3$

3.

31.5 cm
14 cm
14 cm
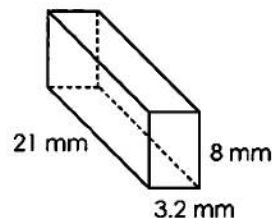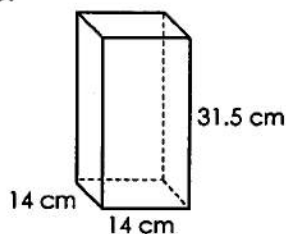
$V = 14(14)(31.5)$

$= 6174 \text{ cm}^3$

4.

4 m
$9\frac{1}{8}$ m
$5\frac{3}{4}$ m
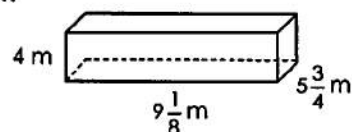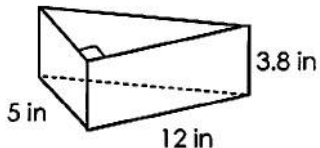
$V = 4\left(9\frac{1}{8}\right)\left(5\frac{3}{4}\right)$

$= 4(9.125)(5.75)$

$= 209.875 \text{ m}^3$
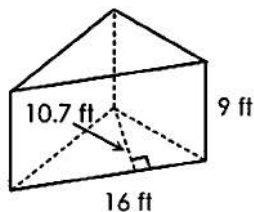
Triangular Prism
EXAMPLES

5.

5 in, 3.8 in, 12 in

$B = \frac{1}{2}(5)(12) = 30$

$V = 30(3.8)$

$\boxed{= 114 \, in^3}$

6.

10.7 ft, 9 ft, 16 ft
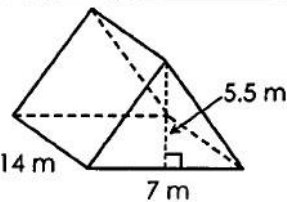
$B = \frac{1}{2}(16)(10.7) = 85.6$

$V = 85.6(9)$

$= \boxed{770.4 \, ft^3}$

7.

5.5 m, 14 m, 7 m

$V = \frac{1}{2}(7)(5.5)(14)$

$= \boxed{269.5 \, m^3}$

8.

19 cm, 7.2 cm, 11 cm
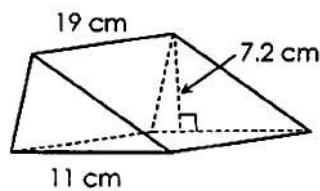
$V = \frac{1}{2}(11)(7.2)(19)$

$= \boxed{752.4 \, cm^3}$

APPLICATIONS

9. The bed of a dump truck has dimensions shown below. The truck is delivering salt to a city in preparation for a snowstorm. If the city needs 800 cubic feet of salt, how many trips will the truck need to make?
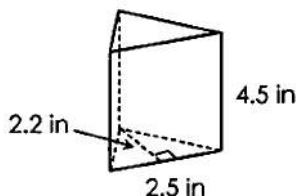

4 ft, 6 ft, 8 ft
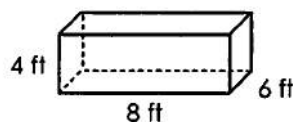
$V = 4(8)(6)$
$= 192 \, ft^3$

$\frac{800}{192} = 4.1\overline{6}$

$\boxed{5 \, trips}$

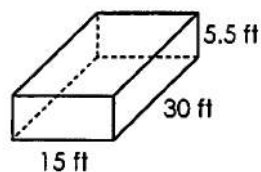**10.** Bethany has a bottle of perfume in the shape of a triangular prism. What is the maximum amount of perfume that the bottle can hold?

4.5 in, 2.2 in, 2.5 in

$V = \frac{1}{2}(2.2)(2.5)(4.5)$

$= \boxed{12.375 \, in^3}$

11. Jon's inground pool is in the shape of a rectangular prism with dimensions shown below. If the pool is only 80% full, find the amount of water in the pool.

5.5 ft, 30 ft, 15 ft

$V = 15(30)(5.5)$
$= 2475$

$2475(.80) = \boxed{1980 \, ft^3}$

Directions: Find the volume of each prism.

1.

12 mm   5 mm   2 mm

$V = 12(2)(5)$

$= \boxed{120 \, mm^3}$

2.

$9\frac{1}{4}$ in $8\frac{1}{2}$ in   11 in

$V = (8.5)(11)(9.25)$

$= \boxed{864.875 \, in^3}$

3.

22.6 cm   6.5 cm   10 cm

$V = 6.5 \,(10)(22.6)$

$= \boxed{1469 \, cm^3}$

4.

16 m   14 m   8 m   12 m

$V = \frac{1}{2}(12)(14)(8)$

$= \boxed{672 \, m^3}$

5.

10 yd $12\frac{1}{2}$ yd $7\frac{1}{2}$ yd   10 yd
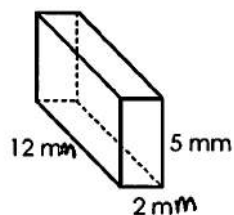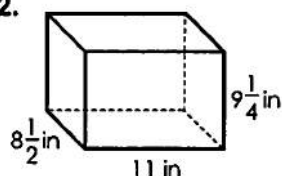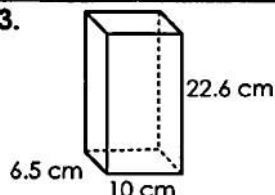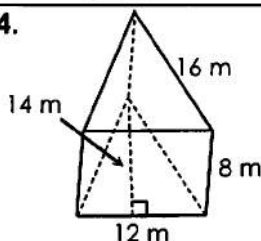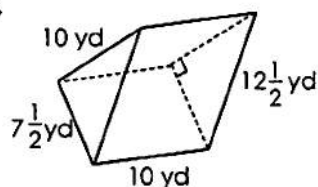
$V = \frac{1}{2}(7.5)(10)(10)$

$= \boxed{375 \, yd^3}$

6.

9 ft   5 ft   4 ft   12 ft   3.4 ft
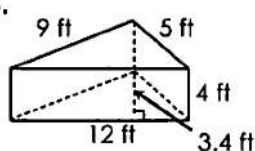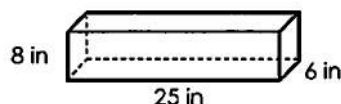
$V = \frac{1}{2}(12)(3.4)(4)$

$= \boxed{81.6 \, ft^3}$

7. Margo just bought a new fish tank. How much water will the tank hold?

8 in   6 in   25 in

$V = 8(25)(6)$

$= \boxed{1200 \, in^3}$

8. Lance ate a large slice of cake. If there are 8 calories in every cubic inch, how many calories did he eat once he finished his slice?
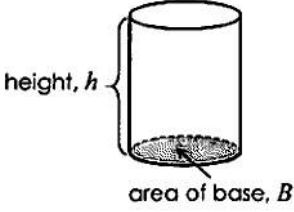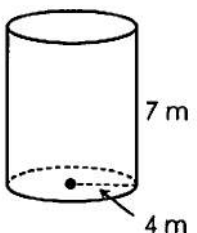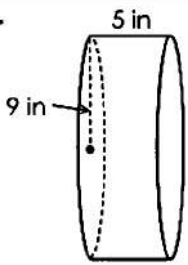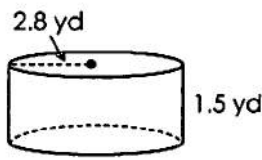
4 in   6 in   7.2 in   5 in
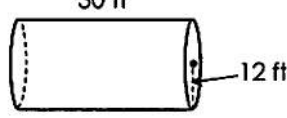
$V = \frac{1}{2}(4)(6)(5)$

$= 60$

$60(8) = \boxed{480 \, cal}$

Name:	Date:
Topic:	Class:

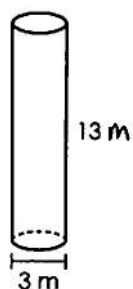| Main Ideas/Questions	Notes/Examples
VOLUME of Cylinders	Just like a prism, the volume of a cylinder is the _product_ of the _area_ of the _base_ and _height_ of the cylinder. height, h area of base, B Formula: $V = B \cdot h$ *Recall that the formula for the area of a circle is $A = \pi r^2$.
EXAMPLES	**Find the volume of each cylinder. Use 3.14 for pi.** **1.** 7 m, 4 m $B = \pi (4)^2$ $= 16(3.14) = 50.24$ $V = 50.24(7)$ $= \boxed{351.68 \ m3}$ **2.** 5 in, 9 in $B = \pi (9)^2$ $= 81(3.14) = 254.34$ $V = 254.34 (5)$ $= \boxed{1271.7 \ in^3}$ **3.** 2.8 yd, 1.5 yd $V = \pi (2.8)^2 (1.5)$ $= 11.76(3.14)$ $= \boxed{36.9264 \ yd^3}$ **4.** 30 ft, 12 ft $V = \pi (12)^2 (30)$ $= 4320(3.14)$ $= \boxed{13564.8 \ ft3}$

5.

16 cm

14 cm

$V = \pi(7)^2(16)$

$= 784(3.14)$

$= \boxed{2461.76 \text{ cm}^3}$

6.

4 mm

10 mm

$V = \pi(5)^2(4)$

$= 100(3.14)$

$= \boxed{314 \text{ mm}^3}$

7.

13 m

3 m

$V = \pi(1.5)^2(13)$

$= 29.25(3.14)$

$= \boxed{91.845 \text{ m}^3}$

8.

8 ft

17 ft

$V = \pi(8.5)^2(8)$
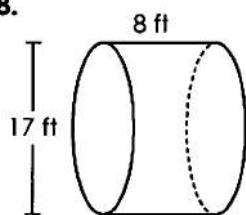
$= 578(3.14)$

$= \boxed{1814.92 \text{ ft}^3}$

APPLICATIONS

9. Martha stores cereal in the cylinder-shaped container shown below. If the container is only 40% full, how much more cereal can she fit in the container? <u>(60%)</u>

8 in

2 in
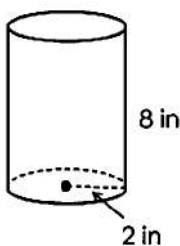
$V = \pi(2)^2(8)$

$= 32(3.14)$

$= 100.48 \text{ in}^3$

$100.48(.60) = \boxed{60.288 \text{ in}^3 \text{ more cereal}}$

10. A round bale of hay has dimensions shown below. If the hay weighs approximately 11 pounds per cubic foot, find the weight of the hay.
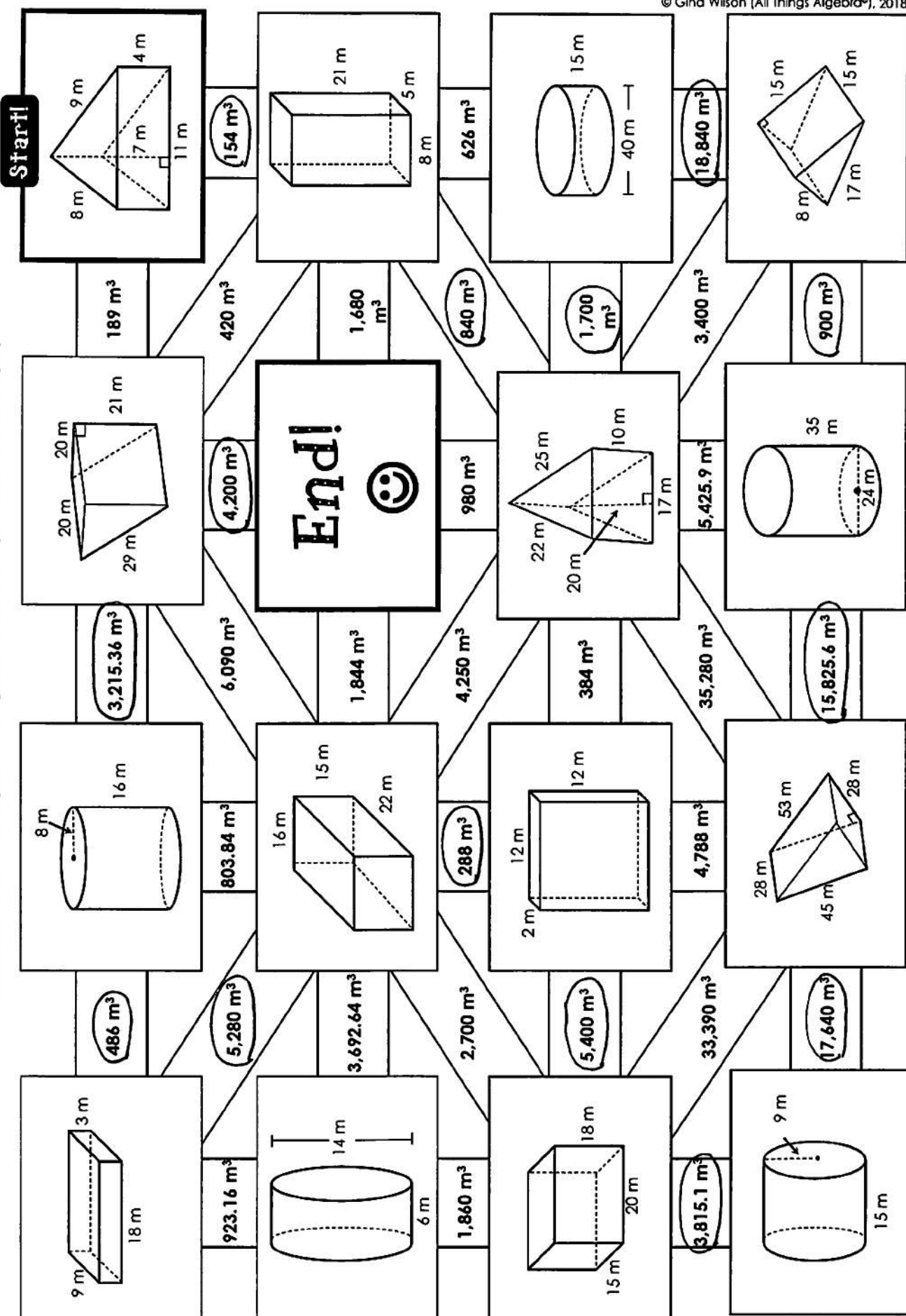
4 ft

5 ft

$V = \pi(2.5)^2(4)$
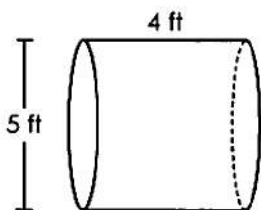
$= 25(3.14)$

$= 78.5 \text{ ft}^3$

$78.5(11) = \boxed{863.5 \text{ pounds}}$

Volume of Prisms & Cylinders Maze!

Directions: Find the volume of each prism or cylinder. Use 3.14 for pi when necessary. Use your solutions to navigate through the maze. **Staple all work to this paper!**
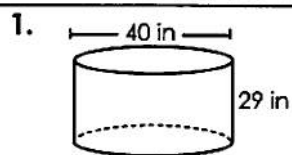
Name: _____   **Unit 7:** Measurement (Area and Volume)

Date: _____ **Per:** _____   **Homework 10:** Volume of Cylinders

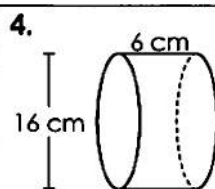**Directions:** Find the volume of each cylinder. Use 3.14 for pi.

1.

40 in

29 in

$V = \pi(20)^2(29)$

$= 11600(3.14)$

$= \boxed{36{,}424 \text{ in}^3}$

2.

2.3 ft

1.2 ft
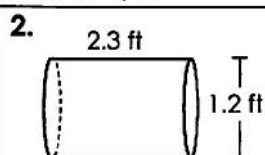
$V = \pi(0.6)^2(2.3)$

$= 0.828(3.14)$

$= \boxed{2.59992 \text{ ft}^3}$

3.

8 in

5 in
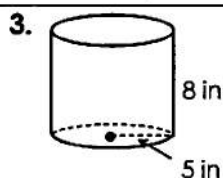
$V = \pi(5)^2(8)$

$= 200(3.14)$

$= \boxed{628 \text{ in}^3}$

4.

6 cm

16 cm

$V = \pi(8)^2(6)$

$= 384(3.14)$

$= \boxed{1205.76 \text{ cm}^3}$

5.

15 mm

12 mm
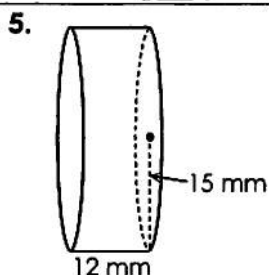
$V = \pi(15)^2(12)$

$= 2700(3.14)$

$= \boxed{8478 \text{ mm}^3}$

6.

3 m

4.2 m
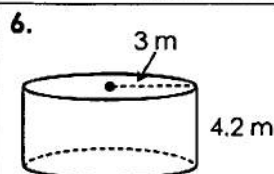
$V = \pi(3)^2(4.2)$

$= 37.8(3.14)$

$= \boxed{118.692 \text{ m}^3}$

7. Mary bought a new flower vase. How much water will the vase hold?

29 in

9 in

$V = \pi(4.5)^2(29)$

$= 587.25(3.14)$

$= \boxed{1843.965 \text{ in}^3}$
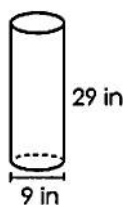
8. Emma is making stepping stones using the mold shown below. How many cubic units of concrete will she need if she wants to make 8 stones?
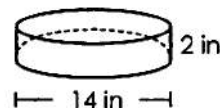
2 in

14 in

$V = \pi(7)^2(2)$

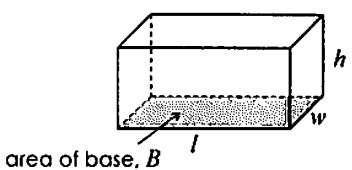$= 98(3.14)$
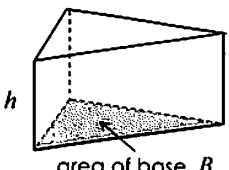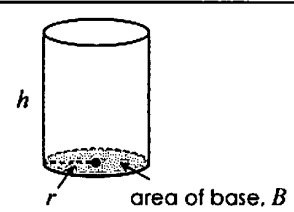
$= 307.72$

$307.72(8) = \boxed{2461.76 \text{ in}^3}$

VOLUME & SURFACE AREA

DEFINITION OF SURFACE AREA AND VOLUME

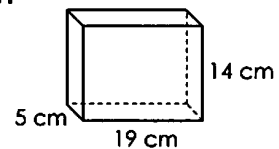**SURFACE AREA:** The sum of the area of the bases and lateral faces.

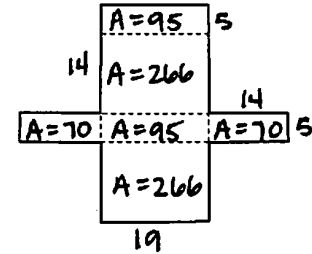**VOLUME:** The amount of space that a 3-dimensional figure takes up.

IMPORTANT FORMULAS

Rectangular Prism	Triangular Prism	Cylinder
area of base, B	area of base, B	r area of base, B
SURFACE AREA: $SA = 2\ell w + 2\ell h + 2wh$	**SURFACE AREA:** $SA = 2B + $ area of lateral sides	**SURFACE AREA:** $SA = 2\pi r^2 + 2\pi rh$
VOLUME: $V = B \cdot h$	**VOLUME:** $V = B \cdot h$	**VOLUME:** $V = B \cdot h$
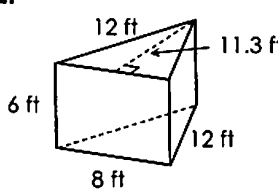
SURFACE AREA EXAMPLES

Find the surface area of each figure using the net.

1.

14 cm   5 cm   19 cm

$A = 95$ 5
14   $A = 266$ 14
$A = 70$ $A = 95$ $A = 70$ 5
$A = 266$
19

$SA = 862 \, cm^2$

2.

12 ft   11.3 ft   6 ft   12 ft   8 ft

11.3
12   5   12
6   $A = 72$ $A = 48$ $A = 72$
$A = 45.2$
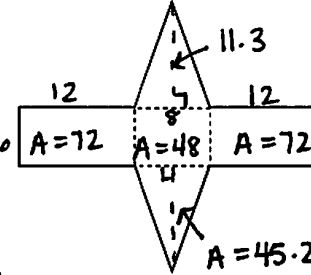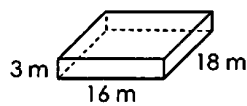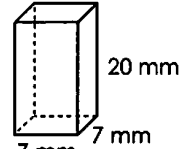
$SA = 282.4 \, ft^2$

Find the surface area of each figure. Use 3.14 for pi when necessary.

3.

3 m   18 m   16 m

$SA = 2(3)(16) + 2(3)(18) + 2(16)(18)$

$= 780 \, m^2$

4.

20 mm   7 mm   7 mm

$SA = 2(7)(7) + 2(7)(20) + 2(7)(20)$

$= 658 \, mm^2$

5.
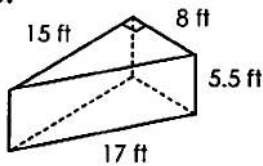
$SA = 2(\frac{1}{2} \cdot 8 \cdot 15) + 8(5.5) + 17(5.5)$
$\qquad\qquad\qquad\qquad + 15(5.5)$

$= \boxed{340 \, ft^2}$

6.
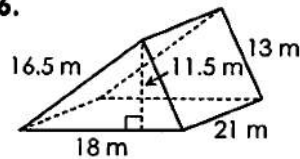
$SA = 2(\frac{1}{2} \cdot 11.5 \cdot 18) + 18(21) + 21(13)$
$\qquad\qquad\qquad\qquad\qquad + 16.5(21)$

$= \boxed{1204.5 \, m^2}$

7.
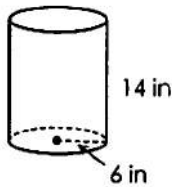
$SA = 2\pi(6)^2 + 2\pi(6)(14)$

$= \boxed{753.6 \, in^2}$

8.
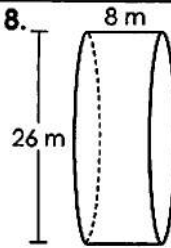
$SA = 2\pi(13)^2 + 2\pi(13)(8)$

$= \boxed{1714.44 \, m^2}$

VOLUME EXAMPLES

Find the volume of each figure. Use 3.14 for pi when necessary.

9.
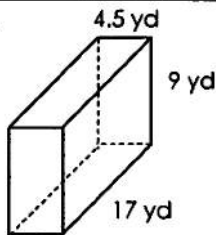
$V = 17(4.5)(9)$

$= \boxed{688.5 \, yd^3}$

10.
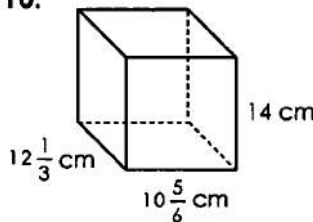
$V = (\frac{37}{3})(\frac{65}{6})(14)$

$= \boxed{1870.\overline{5} \, cm^3}$

11.
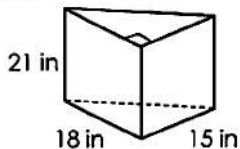
$V = \frac{1}{2}(18)(15)(21)$

$= \boxed{2835 \, in^3}$

12.
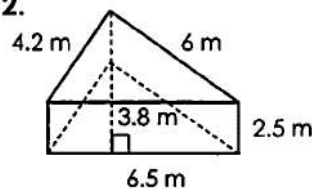
$V = \frac{1}{2}(3.8)(6.5)(2.5)$

$= \boxed{30.875 \, m^3}$

13.
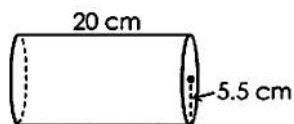
$V = \pi(5.5)^2(20)$

$= \boxed{1899.7 \, cm^3}$

14.
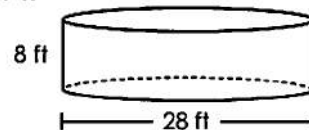
$V = \pi(14)^2(8)$

$= \boxed{4923.52 \, ft^3}$

** This is a 2-page document! **

Directions: Find the surface area of each figure using the net.

1.

9.4 in
4.2 in
4.2 in

A=39.48 4.2
A=39.48 | A=17.64 | A=39.48 | A=17.64 4.2
9.4   4.2
A=39.48
9.4

$SA = 4(39.48) + 2(17.64)$
$= \boxed{193.21 \, in^2}$

2.

8 cm
8.5 cm
6 cm
14 cm

85 | A=119
6 A=84
14
A=24
8.5 | A=119
8

$SA = 84 + 2(119) + 2(24)$
$= \boxed{370 \, cm^2}$

3.

16 m
12 m
20 m
10 m

A=96
16
A=200 | A=120 | A=160
12
20   16
A=96

$SA = 2(96) + 200 + 120 + 160$
$= \boxed{672 \, m^2}$

4.

12.5 ft
8 ft

.4
A=314 12.5
A=50.24
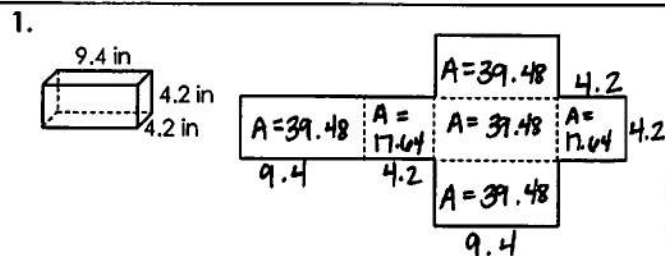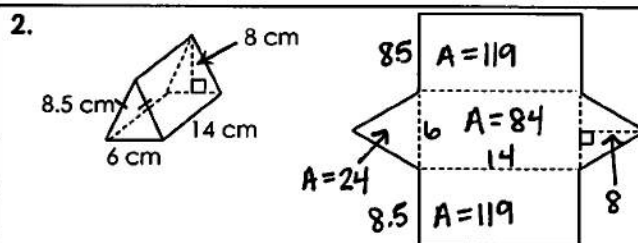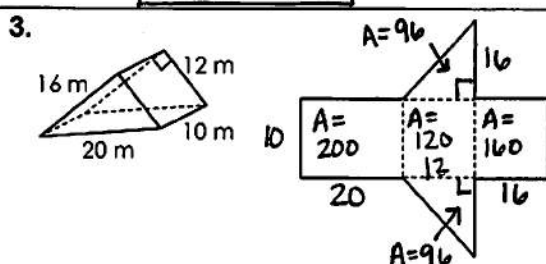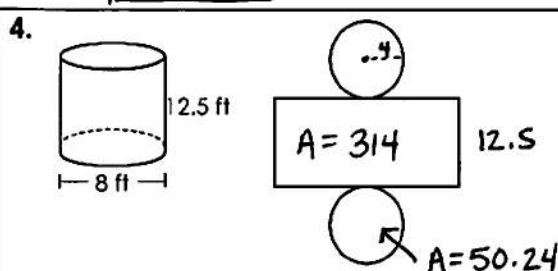
$SA = 2(50.24) + 314$
$= \boxed{414.48 \, ft^2}$

Directions: Find the surface area of each figure. Use 3.14 for pi when necessary.

5.

6 cm
6 cm
8 cm
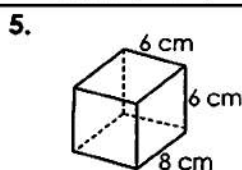
$SA = 2(8)(6) + 2(8)(6) +$
$2(6)(6)$
$= \boxed{264 \, cm^2}$

6.

12 yd
5 yd
$6\frac{1}{2}$ yd
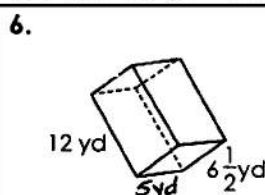
$SA = 2(12)(5) + 2(12)(6.5) + 2(5)(6.5)$
$= \boxed{341 \, yd^2}$

7.

18.6 in
24.8 in
42 in
31 in
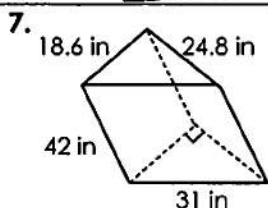
$SA = 2\left(\frac{1}{2} \cdot 24.8 \cdot 18.6\right) + 42(18.6)$
$+ 42(31) + 42(24.8)$
$= \boxed{3586.08 \, in^2}$

8.

8.2 ft
9 ft
12 ft
3 ft
15 ft
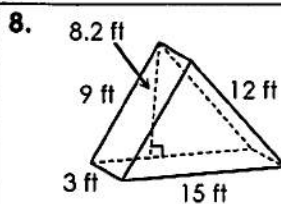
$SA = 2\left(\frac{1}{2} \cdot 15 \cdot 8.2\right) + 3(15) + 3(12)$
$+ 3(9)$
$= \boxed{231 \, ft^2}$

9.
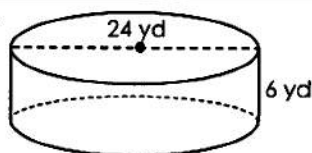
24 yd · 6 yd

$SA = 2\pi(12)^2 + 2\pi(12)(6)$

$= 904.32 + 452.16$

$= \boxed{1,356.48 \text{ yd}^2}$

10.

9.8 m · 30 m
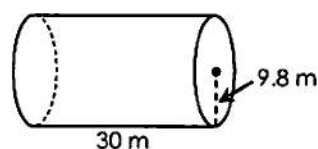
$SA = 2\pi(9.8)^2 + 2\pi(9.8)(30)$

$= 603.1312 + 1846.32$

$= \boxed{2,449.4512 \text{ m}^2}$

Directions: Find the volume of each figure. Use 3.14 for pi when necessary.

11.

9 yd · 23 yd · 30 yd

$V = 30(23)(9)$

$= \boxed{6,210 \text{ yd}^3}$

12.

6 cm · 7.4 cm · 7.4 cm

$V = 6(7.4)(7.4)$

$= \boxed{328.56 \text{ cm}^3}$

13.

17 in · 3 in · 8 in · 15 in

$V = \frac{1}{2}(15)(8)(3)$

$= \boxed{180 \text{ in}^3}$

14.

21 m · 12 m · 9 m · 25 m · 9m

$V = \frac{1}{2}(25)(9)(9)$

$= \boxed{1,012.5 \text{ m}^3}$

15.

41 mm · 34 mm

$V = \pi(20.5)^2(34)$

$= \boxed{44,865.89 \text{ mm}^3}$

16.

6 ft · 14.3 ft
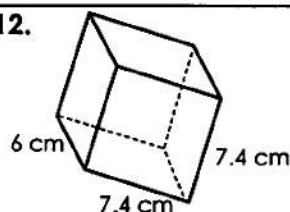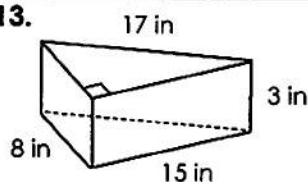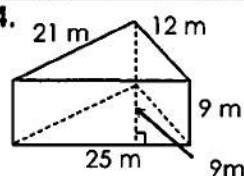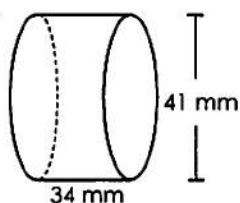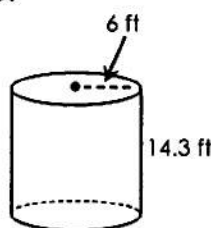
$V = \pi(6)^2(14.3)$

$= \boxed{1,616.472 \text{ ft}^3}$

Name: _____ **Math 7**

Date: _____ **Per:** _____ **Unit 7:** Measurement (Area & Volume)

Quiz 7-3: Surface Area and Volume

For questions 1-2: Find the surface area of each figure using the net.

1.

15

| A = 72 | 4.8 | 15 |
A=43.2 | A = 135 | A=43.2 | A = 135 | 9
| 4.8 | A = 72 |
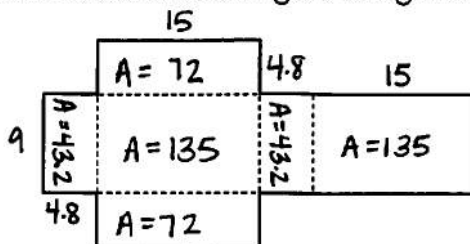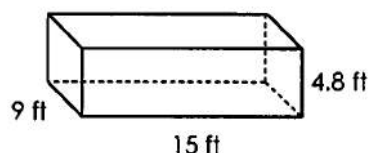
1. __500.4 ft²__

2. __780.6 m²__

3. __125 mm²__

4. __280.6 in²__

5. __422.2 cm²__

6. __376.8 ft²__

2.

12 15 A=90

12 15

A=156 19.2 A= 249.6 A=195 13

12 15

A=90
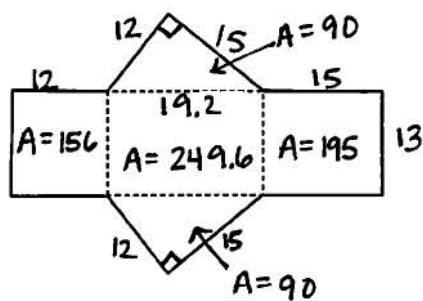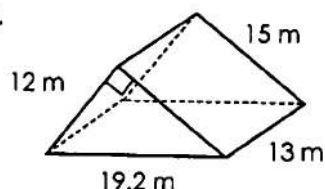
For questions 3-7: Find the surface area of each figure. Use 3.14 for pi when necessary.

3.

5 mm   2 mm   7.5 mm

$SA = 2(7.5)(2) + 2(2)(5) + 2(5)(7.5)$
$= 30 + 20 + 75$

4.

8.5 in   10 in   6 in   4.6 in   16 in

$SA = 2 \cdot \left(\frac{1}{2} \cdot 16 \cdot 4.6\right) + 10(6)$
$+ 8.5(6) + 16(6)$

5.

10 cm   13.7 cm   14 cm   6 cm
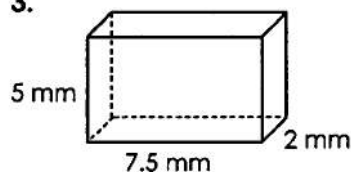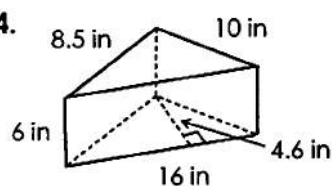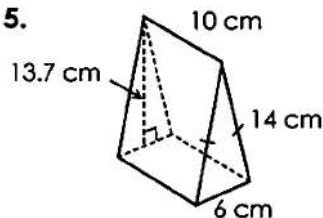
$SA = 2 \cdot \left(\frac{1}{2} \cdot 6 \cdot 13.7\right) + 10(14)$
$+ 10(14) + 6(10)$

6.

6 ft   4 ft

$SA = 2\pi(6)^2 + 2\pi(6)(4)$

7.

32 m

21 m
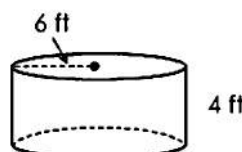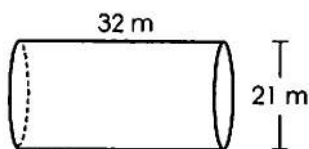
$$SA = 2\pi(10.5)^2 + 2\pi(10.5)(32)$$

For questions 8-12: Find volume of each figure. Use 3.14 for pi when necessary.

8.

20.5 mm

8.4 mm

3 mm

$$V = 8.4(3)(20.5)$$

9.

4.1 cm   7 cm

16 cm
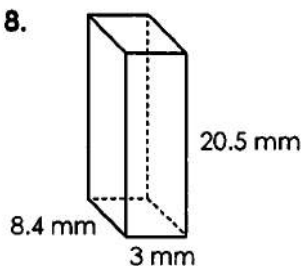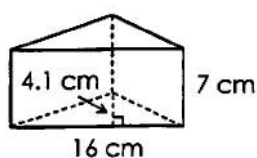
$$V = \tfrac{1}{2}(4.1)(16)(7)$$

8. ___516.6 mm³___

9. ___229.6 cm³___

10. ___740.88 yd³___

11. ___5849.82 ft³___

12. ___157 in³___

10.

18.2 yd

16.8 yd

7 yd   12.6 yd

$$V = \tfrac{1}{2}(16.8)(7)(12.6)$$

11.

23 ft

⊢ 18 ft ⊣

$$V = \pi(9)^2(23)$$

12.

2 in

5 in
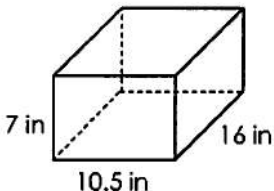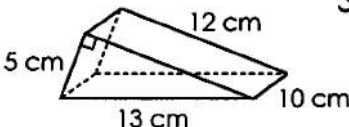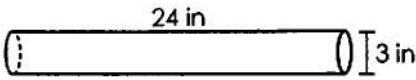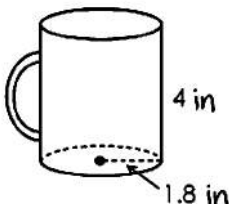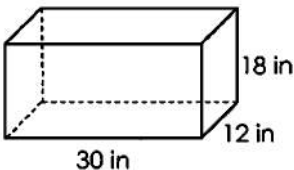
$$V = \pi(5)^2(2)$$

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
SURFACE AREA Applications	RECALL: SA is the sum of the side areas. 1. A birthday gift is placed in the box below. What is the minimum amount of wrapping paper needed to wrap the box? 7 in, 16 in, 10.5 in $SA = 2(7)(10.5) + 2(10.5)(16) + 2(7)(16)$ $= 707 \text{ in}^2$ of paper 2. A wedge of cheese is in the shape of the solid shown below. What is the minimum amount of plastic wrap needed to wrap the cheese? 12 cm, 5 cm, 10 cm, 13 cm $SA = 2\left[\frac{1}{2}(5)(12)\right] + 12(10) + 13(10) + 5(10)$ $= 360 \text{ cm}^2$ of plastic wrap 3. Wrapping paper is rolled around a hollow cardboard tube with dimensions shown below. What is the minimum amount of cardboard needed to create the tube? 24 in, 3 in $SA = 2\pi(1.5)^2 + 2\pi(1.5)(24)$ $= 240.21 \text{ in}^2$ of cardboard
VOLUME Applications	RECALL: V is the product of the base area + height. 4. The dimensions of Samantha's coffee mug are shown below. If she filled the mug leaving a ½ inch gap at the top, how much coffee is in her mug? 4 in, 1.8 in $V = \pi(1.8)^2 (3.5)$ $= 35.6076 \text{ in}^3$ of coffee 5. Find the amount of water needed to fill three-fourths of the fish tank below. 18 in, 12 in, 30 in $V = 30(12)(18)$ $= 6480$ $6480(0.75) = 4860 \text{ in}^3$ of water

6. Kayla has a triangular planter box with dimensions shown below in the corner of her garden. How much soil will she need to fill the planter?

4 ft   4 ft

2.5 ft

5.7 ft
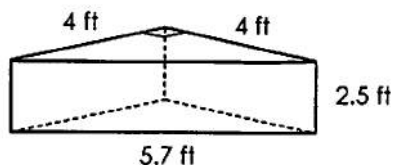
$$V = \frac{1}{2} \cdot 4 \cdot 4 \cdot 2.5$$

$$= \boxed{20 \ ft^3 \text{ of soil}}$$

MIXED PRACTICE

7. Solid concrete blocks with the dimensions shown below are being used to build a retaining wall. If the concrete weighs 95 pounds per cubic foot, how much does one block weigh?

1.8 ft

3 ft

1.8 ft
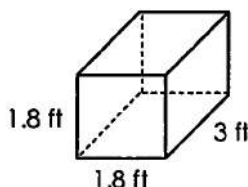
$$V = (1.8)(1.8)(3)$$

$$= 9.72 \ ft^3$$

$$9.72(95) = \boxed{923.4 \text{ pounds}}$$

8. The dimensions of a glass candle holder are shown below. How much glass was used to create the candle holder?

10.5 in

⊢ 4 in ⊣
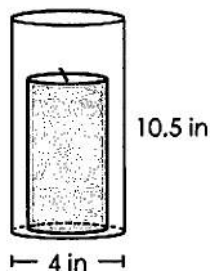
$$SA = \pi (2)^2 + 2\pi(2)(10.5)$$

$$= 4(3.14) + 42(3.14)$$

$$= \boxed{144.44 \ in^2}$$

9. Charlie is building a skateboarding ramp with the dimensions below using 2' by 4' sheets of plywood. What is the minimum number of plywood sheets needed to build the ramp? $\overline{(8ft^2)}$

3.5 ft   7.2 ft

4 ft

6 ft
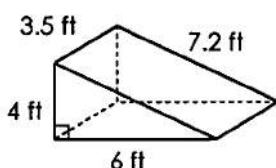
$$SA = 2\left(\frac{1}{2} \cdot 4 \cdot 6\right) + 3.5(4) + 3.5(7.2)$$
$$+ 3.5(6)$$

$$= 84.2 \ ft^2$$

$$\frac{84.2}{8} = 10.525 \qquad \boxed{11 \text{ sheets}}$$

10. The dimensions of Lily's swimming pool are shown below. If one cubic foot of water is approximately 7.5 gallons, how many gallons of water can the pool hold at maximum?

5.5 ft

⊢ 24 ft ⊣
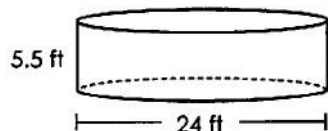
$$V = \pi (12)^2 (5.5)$$

$$= 2486.88 \ ft^3$$

$$2486.88(7.5) = \boxed{18,651.6 \text{ gal}}$$

Name: _____

Date: _____ **Per:** _____

Unit 7: Measurement (Area and Volume)

Homework 12: Volume and Surface Area Applications

** This is a 2-page document! **

---

1. Nick is baking fudge. What is the minimum amount of plastic wrap needed to cover this piece of fudge?

4 in
6 in   1.8 in
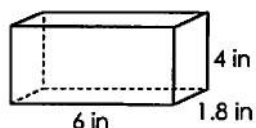
$SA = 2(6)(1.8) + 2(6)(4) + 2(1.8)(4)$

= **84 in² of plastic wrap**

---

2. A jeweler designed a new box for earrings. The box is to be covered in leather. How much leather will be needed?

3 in   3.2 in
2 in   2 in
4 in
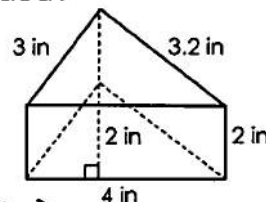
$SA = 2\left(\frac{1}{2} \cdot 2 \cdot 4\right) +$
$3(2) + 3.2(2) + 4(2)$

= **28.4 in² of leather**

---

3. Mary Kate is wrapping a vase for a gift. What is the minimum amount of wrapping paper she will need?

12 in
2 in
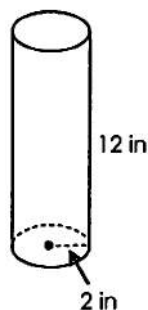
$SA = 2\pi(2)^2 +$
$\quad\quad 2\pi(2)(12)$

= **175.84 in² of Wrapping paper**

---

4. Mrs. Hanson is filling containers in her bakery with flour. How much flour will fit into two of the containers?

8 in
3 in
6 in
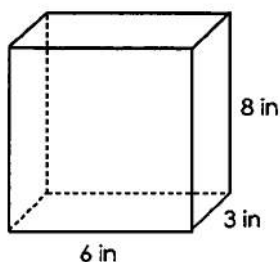
$V = 6(3)(8) = 144 \text{ in}^3$

$2(144) =$ **288 in³ of flour**

---

5. Vivian is filling a cooler with a sports drink for her soccer team. What is the maximum amount of liquid the cooler can hold?

21 in
13 in
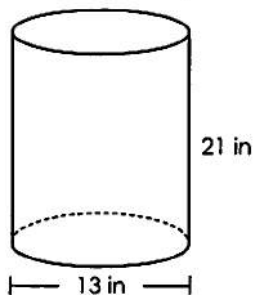
$V = \pi(6.5)^2(21)$

= **2785.965 in³ of liquid**

---

6. A construction company removed a large portion of dirt to begin building a bridge. How much dirt was removed?

9 m   6 m
7 m
5 m
10 m

$V = \frac{1}{2}(6)(10)(9)$
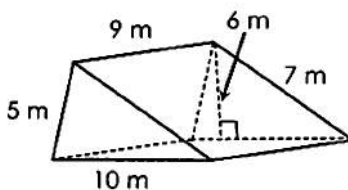
= **270 m³ of dirt**

7. Beth is staining a barn door. If one pint of stain covers 562 square inches, how many cans of stain will she need?

600 in | 148 in | 3 in

$SA = 2(148)(3) +$
$\quad 2(600)(3) +$
$\quad 2(148)(600)$

$= 182,088 \text{ in}^2$

$\dfrac{182088}{562} = \boxed{324 \text{ Cans of stain}}$

8. Luca filled four jars with sweet tea. How much sweet tea did he have in total?

5.2 in | 3.2 in

$V = \pi (1.6)^2 (5.2)$
$\quad = 41.49968 \text{ in}^3$
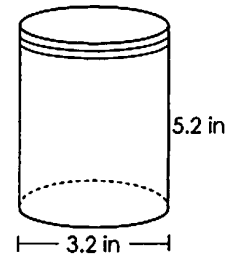
$41.49968 (4)$
$= \boxed{167.19872 \text{ in}^3 \text{ of tea}}$

9. Travis wants to store as much as possible in his attic. Find the total amount of storage space he has available.

6 ft | 11 ft | 11 ft | 30 ft | 18 ft
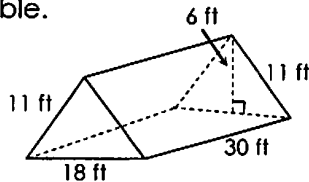
$V = \frac{1}{2}(18)(6)(30)$

$= \boxed{1,620 \text{ ft}^3 \text{ of space}}$

10. A steamroller is pressing asphalt. What is the area that will be covered by three revolutions?

9 ft | 3 ft
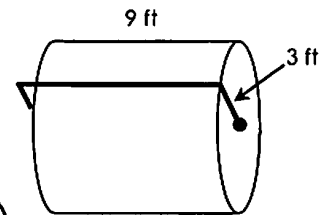
$A = 2\pi (3)(9)$
$\quad = 54(3.14)$
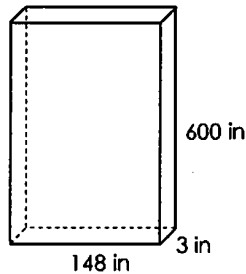$\quad = 169.56 \text{ ft}^2$

$169.56(3) = \boxed{508.68 \text{ ft}^2}$

11. Marci is designing a new popcorn bag for the movie theater. How much paper will she need to create the bag?

10.6 in | 3 in | 8.2 in
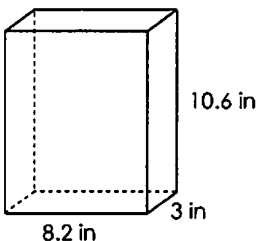
$SA = 8.2(3) + 2(3)(10.6)$
$\quad + 2(8.2)(10.6)$
$= \boxed{262.04 \text{ in}^2 \text{ of paper}}$

12. Nate rented a moving truck. How many 3.375 cubic foot boxes can he fit in the truck?

15 ft | 7.5 ft | 7.5 ft
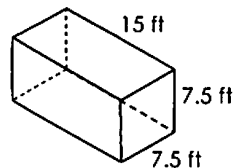
$V = 7.5(7.5)(15)$
$\quad = 843.75 \text{ ft}^3$

$\dfrac{843.75}{3.375} = \boxed{250 \text{ boxes}}$

Unit 7 Test Study Guide
(Measurement: Area & Volume)

Name: _____

Date: _____ Per: _____

Topic 1: Perimeter and Area of Plane Figures

Find the perimeter and area of each figure.

1.

30 cm · 14.7 cm · 13 cm · 20 cm

$A = \frac{1}{2}(20)(13)$

2.

5.8 m · 6.5 m · 10.6 m

$A = 10.6(5.8)$

3.

42 ft · 18 ft · 20 ft · 30 ft · 14 ft

$A = \frac{1}{2}(18)(42+14)$

Perimeter	Area	Perimeter	Area	Perimeter	Area
64.7 cm	130 cm²	34.2 m	61.48 m²	106 ft	504 ft²

4. Pete walked around a park three times. How many miles did he walk?

1 mi · E. Street · 2 mi · 1.6 mi · W. Street · 2.3 mi · N. Street · S. Street
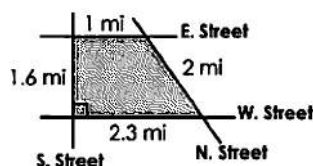
$P = 6.9 mi$

$3(6.9) = \boxed{20.7 mi}$

5. Allen High School is getting new sod for their football field. If sod costs $1.35 per square yard, what will be the total cost?

120 yd · $53\frac{1}{3}$ yd

$A = 120(53\frac{1}{3})$
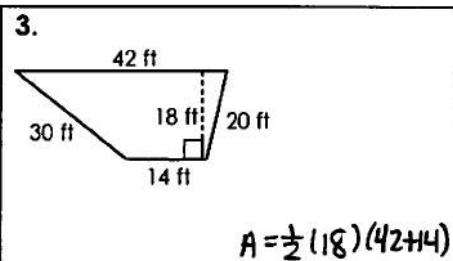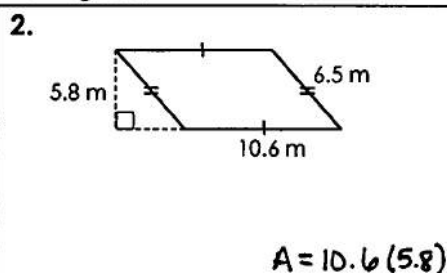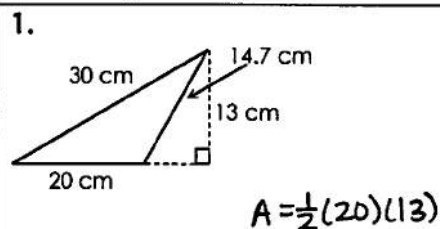$= 6400 yd^2$
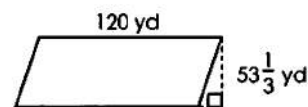
$6400(1.35) = \boxed{\$8640}$

Topic 2: Circumference and Area of Circles

Find the circumference and area of each circle. Use 3.14 for pi.

6.

9.5 in

$2(3.14)(9.5)$ $(3.14)(9.5)^2$

7.

46 mi
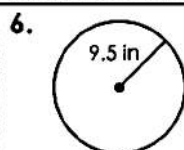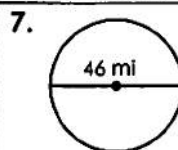
$2(3.14)(23)$ $3.14(23)^2$

Circumference	Area	Circumference	Area
59.66 in	283.385 in²	144.44 mi	1661.06 mi²

8. New lights are being installed around the outside of a ferris wheel. Lights cost $0.75 per foot. What is the total cost of the lights?

70 ft
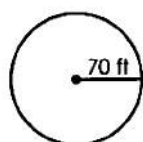
$C = 2(3.14)(70)$
$= 439.6 ft$

$439.6(0.75) = \boxed{\$329.70}$

9. A farmer has a circular shaped field. Fertilizer costs $0.27 per square yard. How much will the farmer spend to fertilize the field?

130 yd

$A = \pi(65)^2$
$= 13266.5 yd^2$

$13266.5(.27) = \boxed{\$3581.96}$

Topic 3: Perimeter and Area of Composite Figures

Find the perimeter and area of each composite figure. Use 3.14 for pi when necessary.

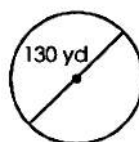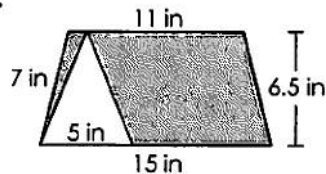| Figure	Perimeter	Area
10. 4 cm, ①, 3 cm, 4.8 cm, 7 cm ②, 5.7 cm, 6.8 cm	$P = 2(4) + 3 + 5.7 + 6.8 + 4.8$ $= \boxed{28.3 \text{ cm}}$	$A_1 = \frac{1}{2}(6.8)(2.2)$ $= 7.48$ $A_2 = \frac{1}{2}(4.8)(6.8 + 9.8)$ $= 39.84$ $A = 7.48 + 39.84 = \boxed{47.32 \text{ cm}^2}$
11. ① 8, 22 yd, 14 yd ②, 11 yd	$P = \frac{1}{2}(2\pi 8) + 14 + 11 + 14$ $= 8(3.14) + 39$ $= 25.12 + 39$ $= \boxed{64.12 \text{ yd}}$	$A_1 = \frac{1}{2}\pi 8^2 = 32(3.14)$ $= 100.48$ $A_2 = 14(11)$ $= 154$ $A = 100.48 + 154 = \boxed{254.48 \text{ yd}^2}$
12. ① 4 m, 8 m, 11.3 m ②, 16 m	$P = \frac{1}{2}(2\pi 4) + 8 + 8 + 11.3$ $= 4(3.14) + 27.3$ $= 12.56 + 27.3$ $= \boxed{39.86 \text{ m}}$	$A_1 = \frac{1}{2}\pi 4^2 = 8(3.14)$ $= 25.12$ $A_2 = \frac{1}{2}(8)(16 + 8)$ $= 96$ $A = 25.12 + 96 = \boxed{121.12 \text{ m}^2}$

13. An aquarium is putting up new railing around the otter exhibit. How many feet of railing does the aquarium need to install?

$P = 4(7.7) + 2(3) + 8.2$

$= \boxed{45 \text{ ft of railing}}$

6.5 ft, 8.2 ft, 3 ft, 7.7 ft, 16 ft

14. The playground at a park is getting new wood chips. Wood chips cost $15 per square yard. What is the total cost of the wood chips?

$A_1 = \frac{1}{2}(11)(14.4 + 21) = 194.7$

$A_2 = 4(25.5) = 102$

$A = 194.7 + 102 = 296.7 \text{ yd}^2$

$296.7(15)$

$= \boxed{\$4450.50}$

4 yd, 4.5 yd, 25.5 yd, 14.4 yd, 15 yd

© Gina Wilson (All Things Algebra®) and Lindsay Perro, 2018

Topic 4: Area of Shaded Regions

Find the area of the shaded region. Use 3.14 for pi.

15.

11 in, 7 in, 6.5 in, 5 in, 15 in

$A_{out} = \frac{1}{2}(6.5)(11+15) = 84.5$

$A_{in} = \frac{1}{2}(5)(6.5) = 16.25$

$SA = 84.5 - 16.25 = \boxed{68.25 \text{ in}^2}$

16.

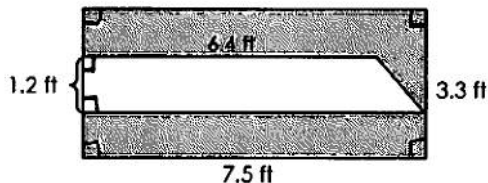6.9 m, 11.5 m, 9.2 m

$A_{out} = \pi(5.75)^2$

$\quad = 33.0625(3.14) = 103.81625$

$A_{in} = \frac{1}{2}(9.2)(6.9) = 31.74$

$SA = 103.81625 - 31.74 = \boxed{72.07625 \text{ m}^2}$

17. Melissa is sewing a flag for her class. How much gray fabric will she use?

6.4 ft, 1.2 ft, 3.3 ft, 7.5 ft

$A_{out} = 3.3(7.5) = 24.75$
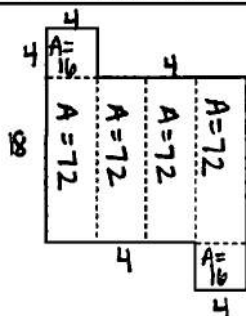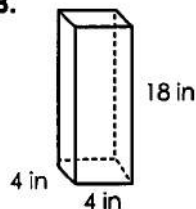
$A_{in} = \frac{1}{2}(1.2)(7.5+6.4) = 8.34$

$SA = 24.75 - 8.34 = \boxed{16.41 \text{ ft}^2}$

Topic 5: Surface Area of Prisms and Cylinders

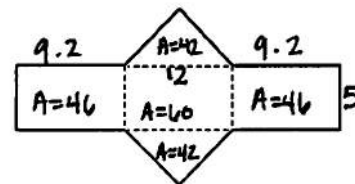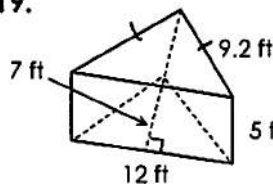**Find the surface area of each figure using the net.**

18.

18 in, 4 in, 4 in

$A=16$, $A=72$, $A=72$, $A=72$, $A=72$, $A=16$

Surface Area: $2(16) + 4(72) = \boxed{320 \text{ in}^2}$

19.

9.2 ft, 7 ft, 5 ft, 12 ft

9.2, 9.2, $A=42$, $A=46$, $A=60$, $A=46$, $A=42$, 12, 5

Surface Area: $2(42) + 2(46) + 60 = \boxed{236 \text{ ft}^2}$

Find the surface area of each figure.

20.

3.4 m, 7 m, 20 m
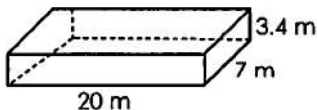
$SA = 2(20)(7) + 2(20)(3.4)$
$\quad + 2(7)(3.4)$

Surface Area: 463.6 m^2

21.

6 cm, 7 cm, 12 cm, 4 cm
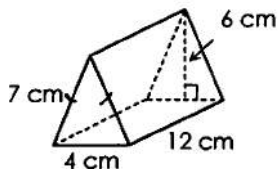
$SA = 2(\frac{1}{2} \cdot 4 \cdot 6) + 4(12) + 7(12)$
$\quad + 7(12)$

Surface Area: 240 cm^2

22.

15 in, 48 in
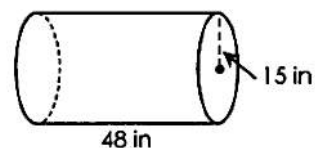
$SA = 2\pi 15^2 + 2\pi(15)(48)$
$\quad = 450(3.14) + 1440(3.14)$

Surface Area: 5934.6 in^2

© Gina Wilson (All Things Algebra®), 2018

Topic 6: Volume of Prisms and Cylinders

Find the volume of each figure. Use 3.14 for pi.	
23. 2.2 m 2.2 m 2.2 m $$V=(2.2)(2.2)(2.2)$$	**24.** 9.5 ft 2 ft 6 ft $$V=6(2)(9.5)$$
Volume: $10.648 \ m^3$	**Volume:** $114 \ ft^3$
25. 20 in 16 in 10 in 12 in $$V=\tfrac{1}{2}(12)(16)(10)$$	**26.** $\vdash\!\!-24 \ yd\!\!-\!\!\dashv$ 8 yd $$V=\pi(12)^2(8) \quad = \quad 1152(3.14)$$
Volume: $960 \ in^3$	**Volume:** $3617.28 \ yd^3$
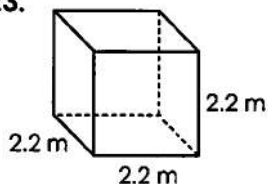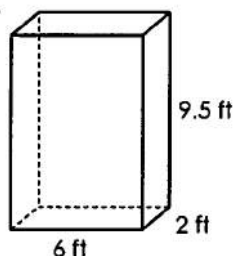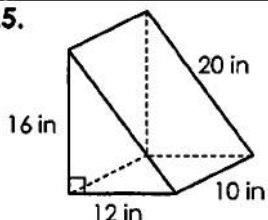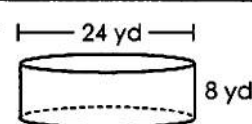
Topic 7: Volume and Surface Area Applications

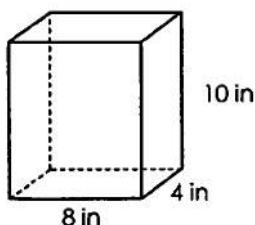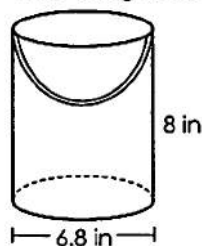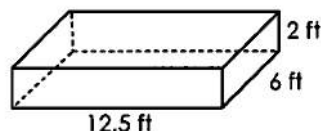|	
27. Ron is building a wheelchair ramp out of wood for his business. How many square feet of wood will he need? 1.5 ft 4.6 ft 2 ft 5 ft 6 ft $$SA = 2\left(\tfrac{1}{2}\cdot 1.5\cdot 5\right)+5(6)+4.6(6)+2(6)$$ $$= \boxed{77.1 \ ft^2 \ of \ wood}$$	**28.** Gavin is building a box for his legos. How many square inches of cardboard will he need? 10 in 4 in 8 in $$SA =2(8)(4)+2(8)(10)+2(4)(10)$$ $$=\boxed{304 \ in^2 \ of \ cardboard}$$
29. The paint in the can below weighs 0.05 pounds per cubic inch. If the can is full, find the weight of the paint in the can. 8 in $\vdash\!\!-6.8 \ in\!\!-\!\!\dashv$ $$V=\pi(3.4)^2(8)$$ $$= 92.48(3.14)$$ $$= 290.3872 \ in^3$$ $$290.3872(0.05)$$ $$=\boxed{14.51936 \ pounds}$$	**30.** Wanda is making a raised garden in her backyard. How much dirt will she need to fill the garden? 2 ft 6 ft 12.5 ft $$V=12.5(6)(2)$$ $$=\boxed{150 \ ft^3 \ of \ dirt}$$
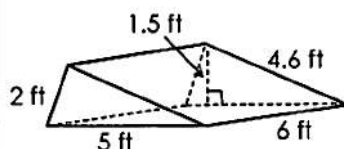
Name: _____

Date: _____ Per: _____

1. Find the area of the figure below.

9 cm

17.5 cm

11.4 cm
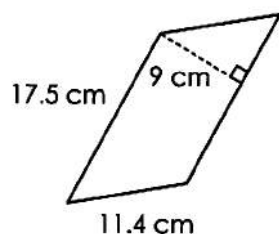
$A = 17.5(9)$

$A = 157.5 cm^2$

2. Scott drove from Franklin to Kenton, Kenton to Maryvale, then back to Franklin. His route is shown below. If his car gets 20 miles per gallon of gas, how many gallons of gas did he use?

Kenton

6 mi   18.5 mi

Franklin   17.5 mi   Maryvale
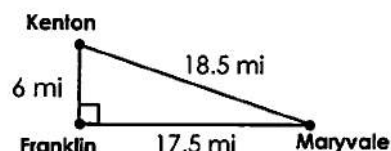
$P = 42$ mi

A. 1.95 gallons
B. 2.10 gallons
C. 2.625 gallons
D. 2.80 gallons

B

3. The area of a rectangle is 344 square inches. If the rectangle is 16 inches wide, find the perimeter of the rectangle.
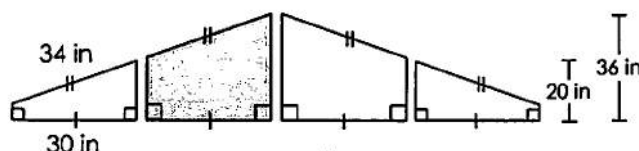
$344 = 16\ell$

$21.5 = \ell$

$P = 2(16) + 2(21.5)$

A. 67 inches
B. 72 inches
C. 75 inches
D. 80 inches

C

4. Kacy has four windows at the peak of her living room. She needs to replace the glass on the shaded window. If glass costs $2.25 per square inch, how much will it cost to replace the window?
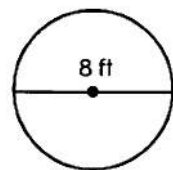
34 in

30 in

36 in
20 in

$A = \frac{1}{2}(30)(20+36)$
$= 840$

A. $1,570
B. $1,650
C. $1,890
D. $2,050

C
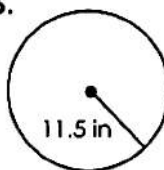
Find the circumference of each circle. Use 3.14 for pi.

5.

8 ft

$C = 2\pi(4)$
$= 8(3.14)$

$C = 25.12 ft$

6.

11.5 in

$C = 2\pi(11.5)$
$= 23(3.14)$

$C = 72.22 in$

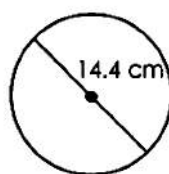**Find the area of each circle. Use 3.14 for pi.**

7.

3 km

$A = \pi(3)^2$
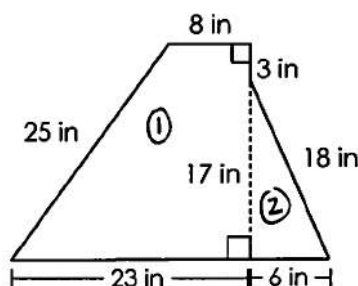$= 9(3.14)$

$A = 28.26 \text{ km}^2$

8.

14.4 cm

$A = \pi(7.2)^2$
$= 51.84(3.14)$

$A = 162.7776 \text{ cm}^2$

9. Find the area of the figure below.

8 in
3 in
25 in
①
17 in
18 in
②
23 in
6 in

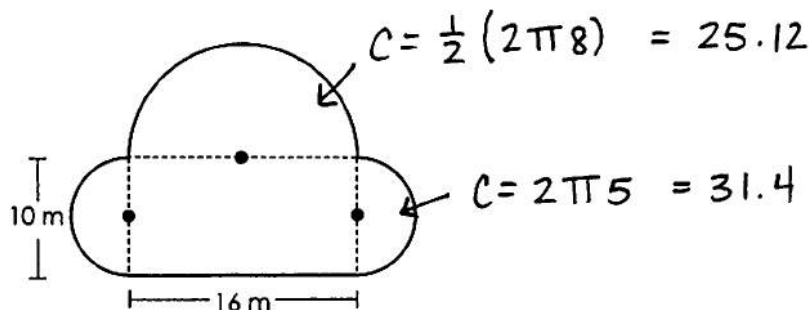$A_1 = \frac{1}{2}(20)(8+23)$
$= 310$

$A_2 = \frac{1}{2}(17)(6)$
$= 51$

$A = 361 \text{ in}^2$

10. Find the perimeter of the figure below. Use 3.14 for pi.

10 m

16 m
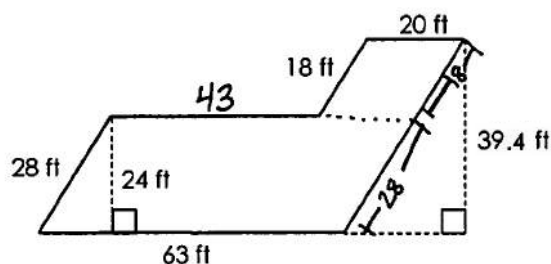
$C = \frac{1}{2}(2\pi8) = 25.12$

$C = 2\pi5 = 31.4$

$P = 72.52 \text{ m}$

11. The science museum is roping off a section of the floor for the new dinosaur exhibit. How many feet of rope do they need?

$P = 43 + 18 + 20 + 46 + 63 + 28$

20 ft
18 ft
43
39.4 ft
28 ft
24 ft
23
63 ft

218 ft

12. A wooden stage at the theater is in the shape shown below. The theater needs to seal the stage. If one can of sealant covers 75 square feet, how many cans are needed?

39 ft

21 ft   ①   21.8 ft

9 ft ②   4.5 ft
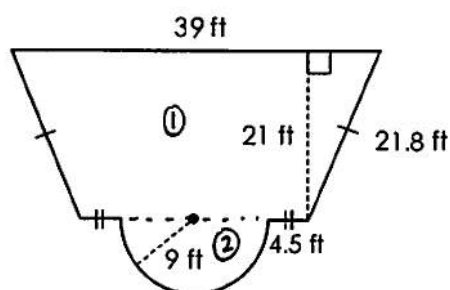
$A_1 = \frac{1}{2}(21)(39 + 27)$

$\quad = 693$

$A_2 = \frac{1}{2}\pi(9)^2$

$\quad = 127.17$

$A = 820.17$

A. 9 cans
B. 10 cans
C. 11 cans
D. 12 cans

$\frac{820.17}{75} = 10.9356$

$\boxed{C}$

---

13. Find the area of the shaded region.

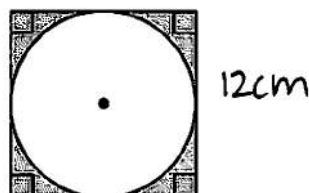14 m

21.3 m   9 m

7 m →
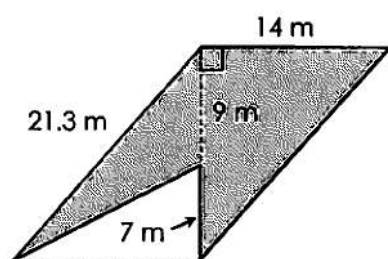
$A_{out} = 14(16) = 224$

$A_{in} = \frac{1}{2}(14)(7) = 49$

$\boxed{A = 175 \text{ m}^2}$

---

14. The perimeter of the square below is 48 centimeters. Find the area of the shaded region. Use 3.14 for pi.
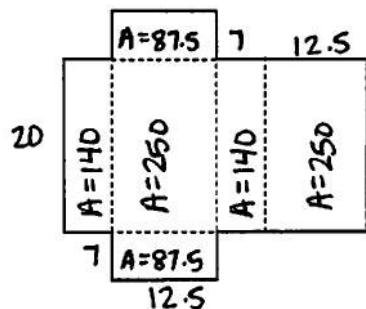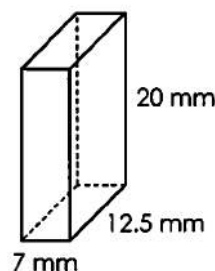
12cm

$A_{out} = 12^2 = 144$

$A_{in} = \pi(6)^2 = 113.04$

$\boxed{A = 30.96 \text{ cm}^2}$

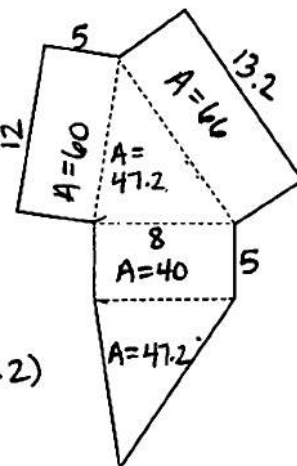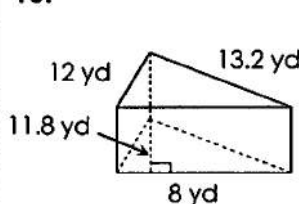**For questions 15-16, use the net to find the surface area of each figure.**

15.

20 mm

12.5 mm

7 mm

A=87.5   7   12.5

20   A=140   A=250   A=140   A=250

7   A=87.5

12.5

$SA = 2(87.5) + 2(140) + 2(250)$

$\boxed{SA = 955 \text{ mm}^2}$

16.

12 yd   13.2 yd

11.8 yd

5 yd

8 yd

5   13.2   A=66

12   A=60   A=47.2

8   A=40   5

A=47.2

$SA = 66 + 60 + 40 + 2(47.2)$
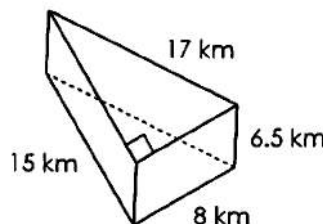
$\boxed{SA = 260.4 \text{ yd}^2}$

17. Find the **surface area** of the figure below.

8 ft 6 ft 4.5 ft
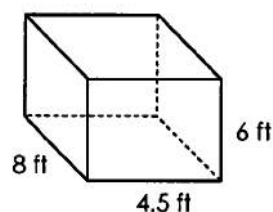
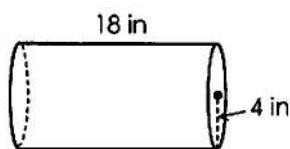$SA = 2(8)(4.5) + 2(8)(6) + 2(4.5)(6)$

$SA = 222 \ ft^2$

18. Find the **surface area** of the figure below.

17 km 6.5 km 15 km 8 km

$SA = 2(\tfrac{1}{2} \cdot 15 \cdot 8) + 8(6.5) + 17(6.5)$
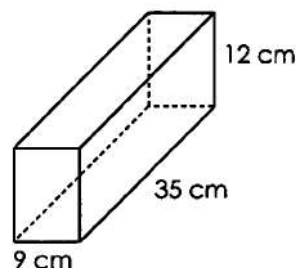$\qquad + 15(6.5)$

$SA = 380 \ km^2$

19. Find the **surface area** of the figure below. Use 3.14 for pi.

18 in 4 in

$SA = 2\pi(4)^2 + 2\pi(4)(18)$
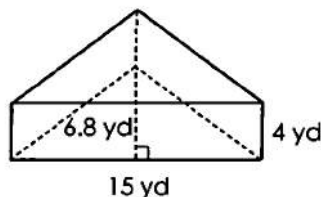$\quad = 32(3.14) + 144(3.14)$

$SA = 552.64 \ in^2$

20. Find the **volume** of the figure below.

12 cm 35 cm 9 cm

$V = 9(35)(12)$

$V = 3780 \ cm^3$

21. Find the **volume** of the figure below.

6.8 yd 4 yd 15 yd

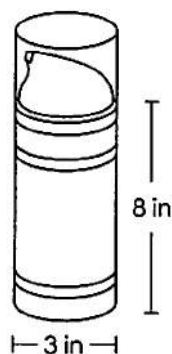$V = \tfrac{1}{2}(6.8)(15)(4)$

$V = 204 \ yd^3$

22. Find the **volume** of the figure below. Use 3.14 for pi.
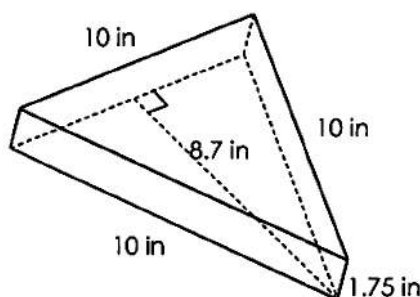

9 m 20 m
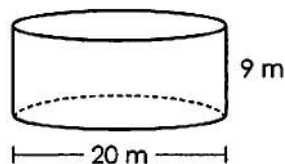
$V = \pi(10)^2(9)$

$V = 2826 \ m^3$

23. The dimensions of a can of shaving cream are shown below. What is the maximum amount of shaving cream in the can? Use 3.14 for pi.

8 in

⊢ 3 in ⊣

$$V = \pi (1.5)^2 (8)$$
$$= 18(3.14)$$

$$56.52 \text{ in}^3$$

24. A pizzeria uses the container below to package their single slices of pizza. What is the minimum amount of cardboard needed to construct the container?

10 in

8.7 in

10 in

10 in

1.75 in

$$SA = 2\left(\frac{1}{2} \cdot 10 \cdot 8.7\right) + 10(1.75) + 10(1.75) + 10(1.75)$$

$$139.5 \text{ in}^3$$

25. When Rick retired from his company, they gave him a solid glass paperweight with the dimensions shown below. If glass weighs 15 grams per cubic inch, how much does the paperweight weigh?
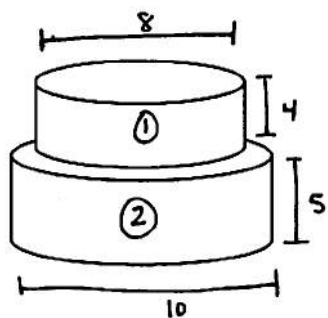
1.25 in

4 in

4 in
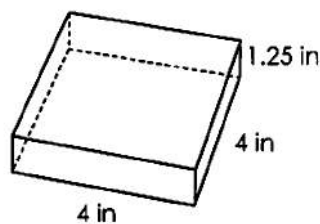
$$V = 4(4)(1.25)$$
$$= 20 \text{ in}^3$$

$$20(15) = 300$$

A. 780 grams
B. 550 grams
C. 410 grams
D. 300 grams

$$D$$

BONUS: Clarissa made a two-layer cake for her parents' anniversary. The bottom layer has a diameter of 10 inches and a height of 5 inches. The top layer has a diameter of 8 inches and a height of 4 inches. What is the total surface of the cake that will be frosted? Use 3.14 for pi.
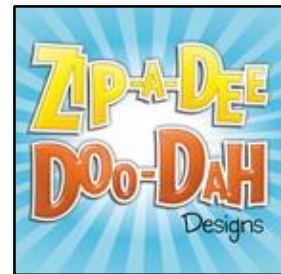
8

①

4

②

5

10

$$SA_1 = \pi(4)^2 + 2\pi(4)(4) = 150.72$$

$$SA_2 = \pi(5)^2 - \pi(4)^2 + 2\pi(5)(5) = 185.26$$

$$SA = 150.72 + 185.26$$

$$335.98 \text{ in}^2$$

I use clipart and
fonts in my products by:

Art with Jenny K

Many thanks to these
talented artists!