THE STUDENT HUB

Sample Exam 6 - Solutions

Session 6 **Total: 75 marks**

SECTION I

1. [1]

$$\begin{array}{r} \overset{8}{\cancel{9}}\ \ \overset{16}{1}6\ \ 5\ \ 7 \\ -\ \ 4\ \ 9\ \ 4\ \ 1 \\ \hline 4\ \ 7\ \ 1\ \ 6 \end{array}$$

2. Write in figures:

   Six hundred and three thousand and forty-seven. [1]

Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Ones
6	0	3	0	4	7

Answer: 603 047

3. State the VALUE of the underlined digit in the following numeral. [1]

$82\underline{7}\,586$

Hundreds of Thousands	Tens of Thousands	**Thousands**	Hundreds	Tens	Ones
8	2	**7**	5	8	6

Answer: 7000

4. Write the number in the box that CORRECTLY completes the following sentence. [1]

$\frac{1}{8} \times \square = 53$

$\square = 53 \div \frac{1}{8}$

$= \frac{53}{1} \times \frac{8}{1}$

$= 424$

Answer: 424

5. Write the following numbers in ascending order (starting with the SMALLEST in value). [1]

6 253 6 523 6 352

Th	H	T	O
6	2	5	3
6	5	2	3
6	3	5	2

The first digit, the thousands digit, is the same for all numbers.

So, we look at the next digit, which is the hundreds digit. We then identify the smallest value with 2 hundreds and the largest value with 5 hundreds.

Answer: 6 253, 6 352, 6 523

6. Write $\frac{25}{6}$ as a mixed number. [1]

$$6\overline{)25} = 4 \text{ Rem } 1$$

Answer: $4\frac{1}{6}$

7. A bakery produces 14 batches of cheese puffs in a day. Each batch contains two dozen puffs. How many cheese puffs are produced in a day? [1]

1 dozen = 12 cheese puffs

2 dozens = 24 cheese puffs

1 batch = 24 cheese puffs

14 batches = 14×24

= 336 cheese puffs

Answer: 336

8. Complete the following number sequence. [1]

3, 5, 9, 15, 23, 33, 45

$3 + 2 = 5$

$5 + 4 = 9$

$9 + 6 = 15$

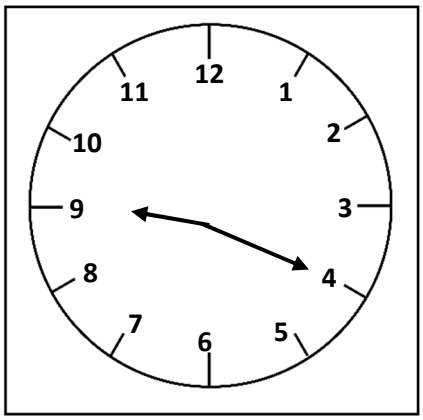
$15 + 8 = 23$

$23 + 10 = 33$

$33 + 12 = 45$

Answer: 45

9. Write the time shown on Clock A, in digital notation, on Clock B. [1]



Digital clock

9 : 20

The hour hand lies between 9 and 10.

The minute hand points to 4.

So, it is 20 minutes past 9.

Hence, the digital notation is 9:20.

10. Convert 3.834 kilometres to metres. [1]

Using the conversion:

1000 m = 1 km

Converting km to m we multiply by 1000:

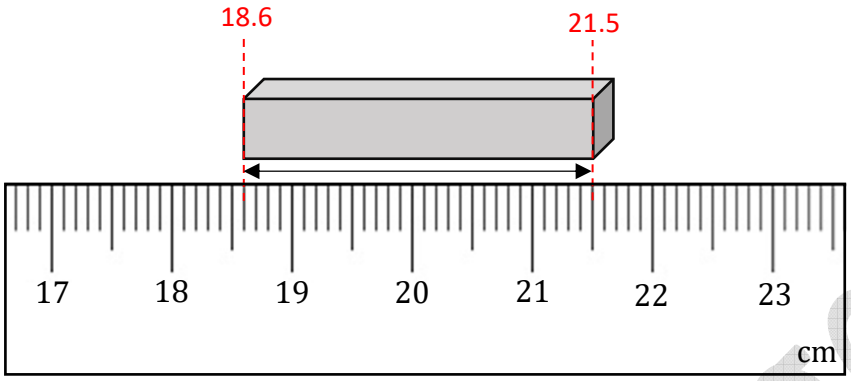
$3.834 \times 1000 = 3\,834$ m

Multiplying by 1000 so we move the decimal point 3 spaces to the right

3.834.

Answer: 3 834 m

11. What is the length of the block to the NEAREST centimetre? [1]



Answer: 3 cm

12. Emeri buys a candy bar for $8.75. How much change should he get if he pays with a $20.00 bill? [1]

Emeri's change = $20.00 − $8.75

$$\begin{array}{r} {}^{1}\not{2}\,{}^{9}\not{0}.0\,0 \\ -\ \$\ \ 8.7\,5 \\ \hline \$\,1\,1.2\,5 \end{array}$$

Answer: $11.25

13. [1]

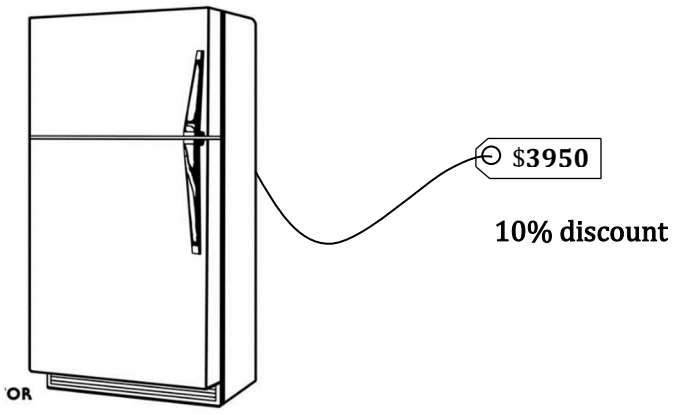
	kg	g
	2	680
+		
	5	360
	7 kg	1040 g

1040 g = 1000 g + 40 g

= 1 kg 40 g

Answer: 8 kg 40 g

14. A refrigerator was advertised as shown below.



Calculate the amount to be paid for the refrigerator after the discount is applied. [1]

Percentage to be paid after discount = 100% - 10%

= 90%

Amount to be paid after discount = $\frac{90}{100} \times \frac{3950}{1}$

= $3555

Answer: $3555

15. The perimeter of a square is 56 m. What is the area of the square? [1]

Perimeter of a square = S × 4

56 = S × 4

S = 56 ÷ 4

= 14 m

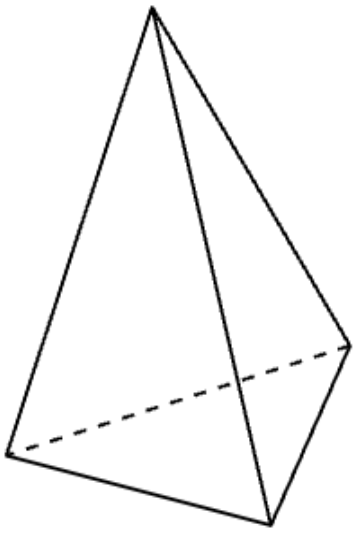
Area of square = S × S

= 14 × 14

= 196 m^2

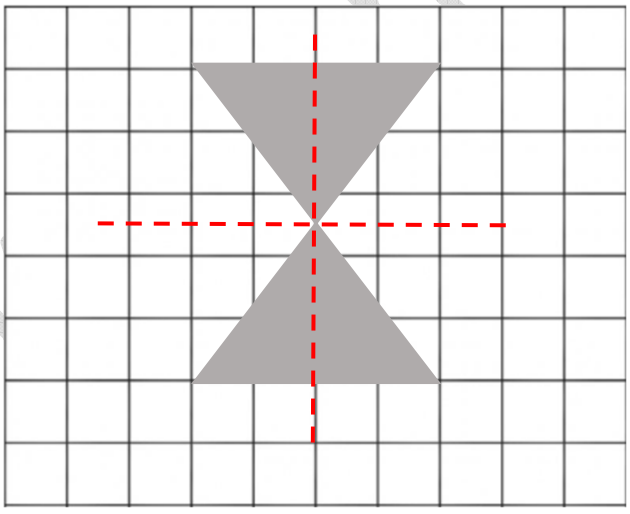
Answer: 196 m^2

16. What is the name of the solid shape shown below? [1]



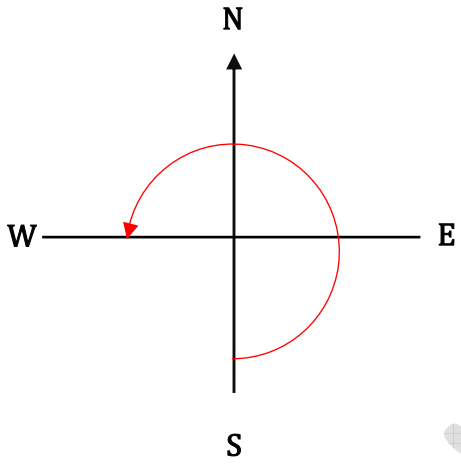
Answer: Triangular based pyramid

17. How many lines of symmetry are there in the following shaded shape? [1]



Answer: 2

18. Denzil is standing facing South and makes THREE ¼ turns in an anticlockwise direction. [1]



In which direction will Denzil now be facing?

Answer: West

19. Altogether, four students own 42 Pokémon cards. Complete the following chart to show the tally for Soraya's Pokémon cards. [1]

Pokémon cards owned

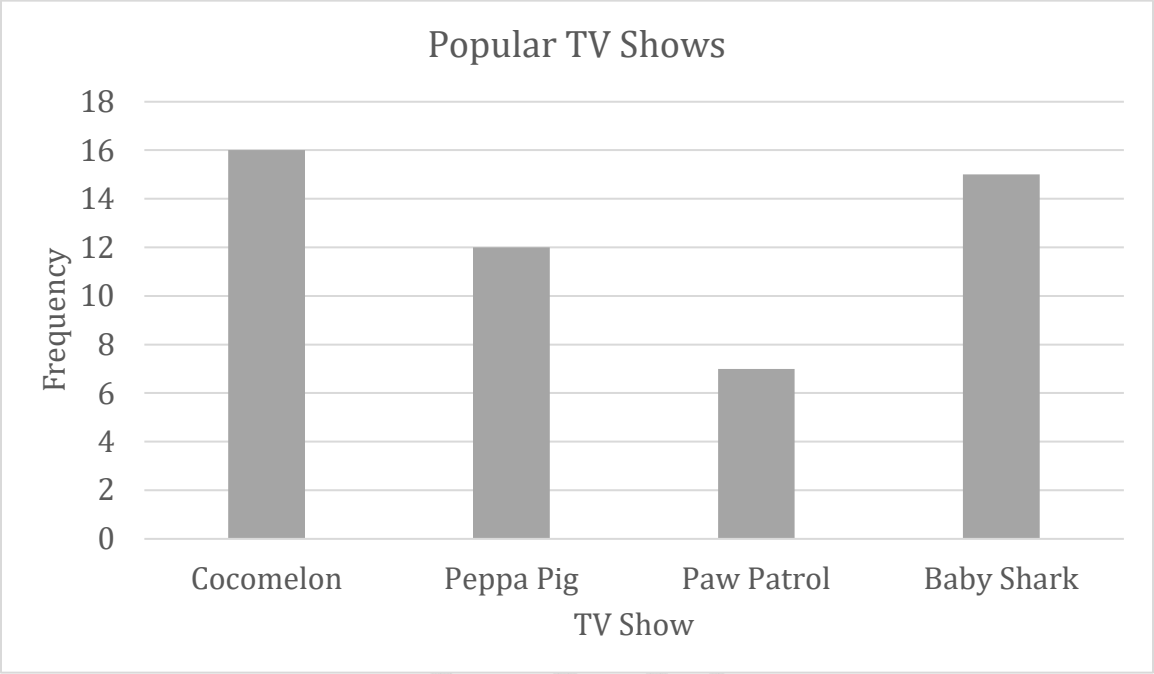
Student	Number of Pokémon cards	Tally
Ozil	12	𝍸 𝍸 ||
Cameron	9	𝍸 ||||
Soraya	7	𝍸 ||
Kristy	14	𝍸 𝍸 ||||

Cards Ozil, Cameron and Kristy own = 12 + 9 + 14
= 35 cards

Cards Soraya own = 42 – 35
= 7 cards

Answer: 𝍸 ||

20. The following bar graph represents some popular TV shows viewed by toddlers.



How many more toddlers need to view Paw Patrol for it to be as popular as Peppa Pig? [1]

Number of toddlers viewing Peppa Pig = 12 toddlers

Number of toddlers viewing Paw Patrol = 7 toddlers

Number of toddlers needed = 12 – 7

= 5 toddlers

Answer: 5

SECTION II

21. $4\frac{3}{5} + 2\frac{1}{3} =$ [2]

Whole Numbers

$= 4 + 2$

$= 6$

Fractions

$= \frac{3}{5} + \frac{1}{3}$

$= \frac{9+5}{15}$

$= \frac{14}{15}$

Answer: $6\frac{14}{15}$

22. Caleb has 78 marbles. Isaiah has 13 marbles more than half Caleb's amount. How many marbles do they have ALTOGETHER? [2]

Caleb's amount = 78 marbles

Half Caleb's amount = ½ × 78

= 39 marbles

Isaiah's amount = Half Caleb's amount + 13

= 39 + 13

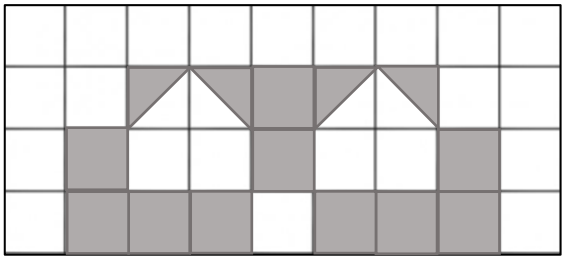
= 52 marbles

Marbles they have altogether = 78 + 52

= 130 marbles

Answer: 130 marbles

23. Express the shaded area of the shape shown below as a decimal fraction of the entire shape. [2]



The shape consists of 4 rows each with 9 equal squares $= 4 \times 9$

$= 36$ squares.

Number of shaded squares $= 10 + 2$

$= 12$

Fraction shaded $= \frac{12}{36} = \frac{1}{3}$

	0.	3	3	3
3	1.	0	0	0
−	0			
	1	0		
−		9		
		1	0	
	−		9	
			1	0
		−		9
				1

Answer: 0.333 recurring

24. Express as a SINGLE decimal fraction: [2]

$$\frac{9}{100} + \frac{3}{10}$$

$$= \frac{9 + (3 \times 10)}{100}$$

$$= \frac{9 + 30}{100}$$

$$= \frac{39}{100}$$

$$= 0.39$$

Answer: 0.39

25. Arianna has 35 pens that are either red, black or blue in colour. There are 7 red ones and equal numbers of black and blue. Calculate the percentage of her pens that are blue. [2]

Total number of pens = 35

Number of black and blue pens = Total number of pens – Number of red pens

= 35 – 7

= 28

Number of blue pens = 28 ÷ 2 (since the number of blue and black pens are equal)

= 14 pens

$$\text{Percentage of pens that are blue} = \frac{\text{Number of blue pens}}{\text{Total number of pens}} \times 100$$

$$= \frac{14}{35} \times 100$$

$$= \frac{1400}{35}$$

$$= 40\%$$

Answer: 40%

26. Shana used 85% of her weekly allowance to buy a daily planner.
She has $12 remaining.
How much was her weekly allowance before buying the daily planner? [2]

Remaining percentage = 100 – 85
= 15%

15% of weekly allowance = $12

Total weekly allowance = $\frac{100}{15} \times 12$

$= \frac{1200}{15}$

= $80

Answer: $80

27. When 3 times a number is added to 28, the answer is the difference between 240 and 463. What is the number? [2]

Difference between 463 and 240 = 463 – 240
= 223

(3 × Number) + 28 = 223

(3 × Number) = 223 – 28

3 × Number = 195

Number = 195 ÷ 3

= 65

Answer: 65

28. Antonio and his cricket team played two matches against their biggest rivals. The team scored 140 runs in the 1st match. Their runs score decreased by 15% in the 2nd match.

a) Calculate the number of runs the team scored in the 2nd match. [1]

Percentage of runs scored = (100% – 15%) of the 1st match
= 85% of the 1st match

Number of runs scored = $\frac{85}{100} \times 140$
= 119 runs

Answer: 119 runs

b) How many runs did they score ALTOGETHER in the matches? [2]

Runs scored altogether = 140 + 119
= 259 runs

Answer: 259 runs

29. a) Mrs Jones cuts 4 cakes, each into EIGHTHS to share at the birthday party. Anna gets $\frac{1}{4}$ of ONE cake. How many EIGHTHS of cake does she get? [1]

Each cake has 8 eighths.

Anna gets $= \frac{1}{4} \times 8$ eighths

$= 2$ eighths

Answer: 2 eighths

b) How many EIGHTHS of cake does Mrs Jones have remaining? [2]

1 cake $= 8$ eighths

4 cakes $= 8 \times 4$

$= 32$ eighths

Amount remaining $= 32 - 2$

$= 30$ eighths

Answer: 30 eighths

30. Onika and her family went to the beach. First, they swam in the ocean for 1 hour and 45 minutes. Then they built sandcastles for 45 minutes and played volleyball for 1 hour and 15 minutes. When they finished playing volleyball, it was 5:30 p.m. What time did Onika's family get to the beach? [3]

Time spent swimming = 1 hr 45 mins

Time spent building sandcastles = 45 mins +

Time spent playing volleyball = 1 hr 15 mins

Total time spent = 2 hrs 105 mins

1 hour = 60 mins

Therefore, 105 mins – 60 mins (1 hour) = 45 mins

So, Onika's family spent 3 hours and 45 minutes at the beach.

We need to subtract 3 hours and 45 minutes from 5:30 p.m. to find the time they arrived at the beach.

Hours	Minutes
4 ~~5~~ − 3	90 ~~30~~ 45
1	45

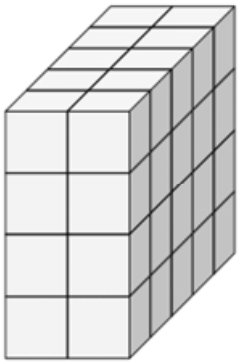
They arrived at the beach at 1:45 p.m.

Answer: 1:45 p.m.

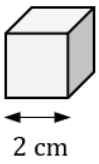
31. Solid Y below is made up of cubes of the same size.

What is the total volume of solid? [3]

Solid Y



One Cube



We count the number on blocks on one face which is **8** in the above diagram.

We then find the number of rows present which is **5** in the above diagram.

Total number of blocks $= 8 \times 5$

$= 40$

Volume of 1 block $= S \times S \times S$

$= 2 \times 2 \times 2$

$= 8\ cm^3$

Volume of solid $= 40 \times 8$

$= 320\ cm^3$

Answer: $320\ cm^3$

32. Mrs. Brown decided to buy some new items to spruce up her house for Christmas. She received the following cost statements from two stores, Courts and Standard, respectively.

COURTS

Quantity	Item	Unit Cost	Price
1	Refrigerator	$3995	$3995
3	Decorative Pillow	$250	____
2	Accent Chair	$650	$1300
		TOTAL	____

TRANSPORTATION FREE!!!

STANDARD

Quantity	Item	Unit Cost	Price
1	Refrigerator	$3850	$3850
3	Decorative Pillow	$210	$630
2	Accent Chair	$670	$1340
		TOTAL	$5820

TRANSPORTATION $250

a) Complete the bill statement for the items from Courts. [2]

Cost of 1 decorative pillow = $250

Cost of 3 decorative pillows = $250 × 3

= $750

TOTAL = $3995 + $750 + $1300

= $6045

COURTS

Quantity	Item	Unit Cost	Price
1	Refrigerator	$3995	$3995
3	Decorative Pillow	$250	$750
2	Accent Chair	$650	$1300
		TOTAL	$6045

TRANSPORTATION FREE!!!

b) Which store offers Mrs. Brown the better purchase given that the store MUST transport the items? [1]

Final Cost = Total cost of items + Transportation fee

Courts: Final Cost = $6045 + $0

= $6045

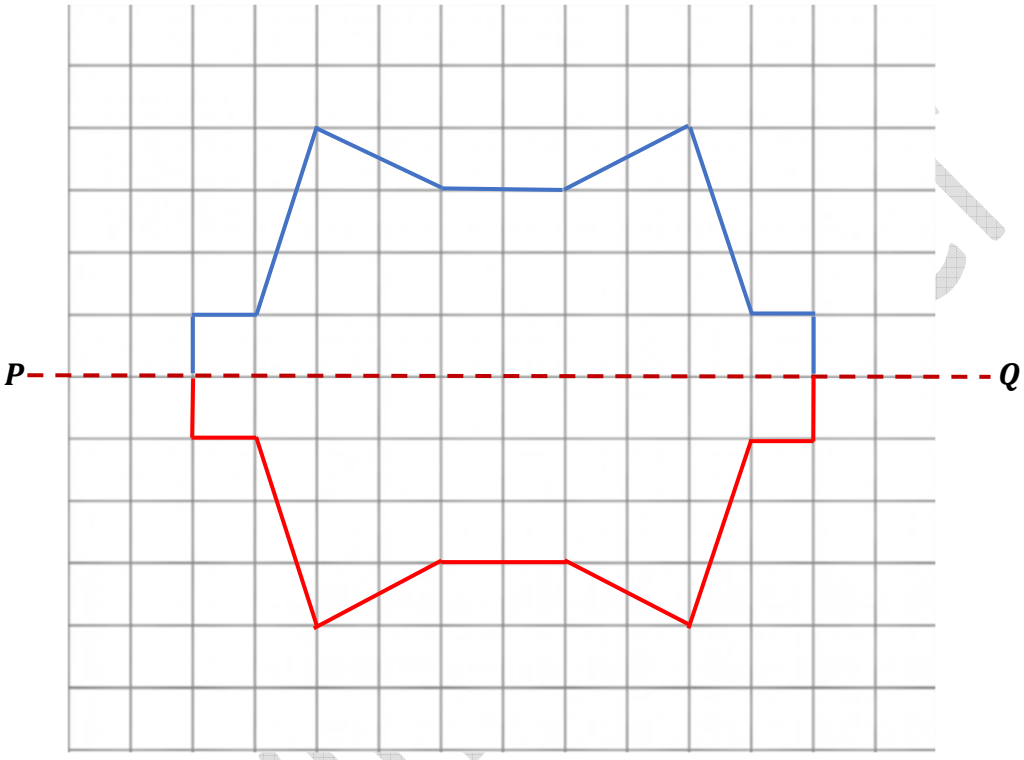
Standard: Final Cost = $5820 + $250

= $6070

Since the final cost associated with Courts is less compared to the final cost associated with Standard; Courts offers the better purchase.

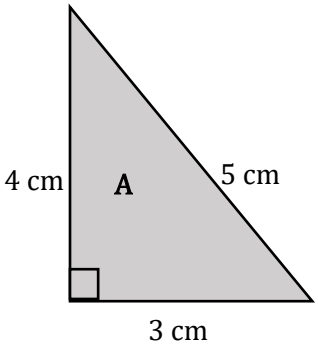
Answer: Courts

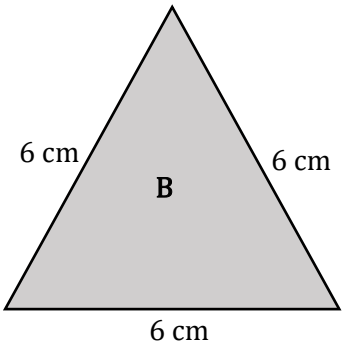
33. In the following diagram, the dotted line PQ is a line of symmetry for the incomplete shape.

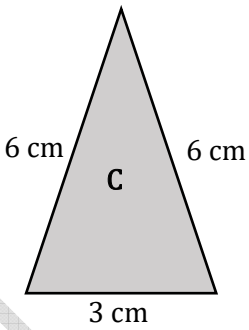


Complete the drawing of the shape. [3]

34. Three triangles, A, B and C, are shown below.





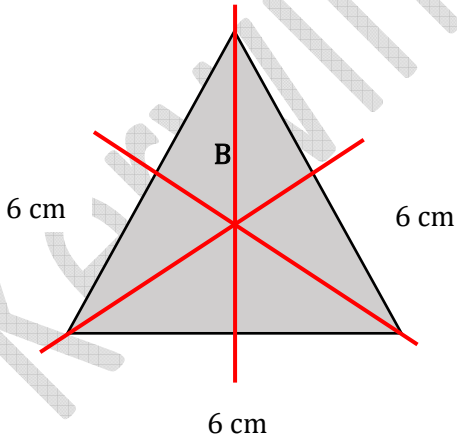


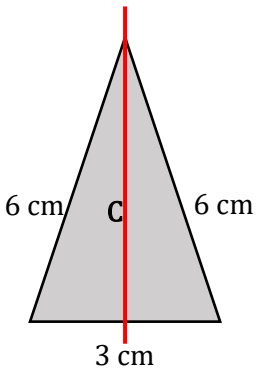
a) Which of the triangles above is an isosceles triangle? [1]

Triangle C has two sides with an equal length of 6 cm therefore it is an isosceles triangle.

Answer: Triangle C

b) Which of the triangles have AT LEAST ONE line of symmetry? [1]





Triangle B has 3 lines of symmetry.

Triangle C has 1 line of symmetry.

Answer: Triangles B and C

35. The following incomplete table shows the number of Standard 5 students in a school who visited Five Islands Water Park over the weekend.

FIVE ISLANDS WATER PARK ATTENDEES

Standard 5	Number of Students who visited
5A	19
5B	15
5C	18
5D	
5E	16
5F	17

The mean number of students who visited from Standard 5 is 17.

How many students visited from Standard 5D? [2]

Total number of students = Mean number of students × Number of classes

= 17 × 6

= 102 students

Number of students from 5A, 5B, 5C, 5E and 5F = 19 + 15 + 18 + 16 + 17

= 85 students

Number of students who visited from 5D = 102 – 85

= 17 students

Answer: 17

36. Use the numbers given in the box below to complete the statements which follow.

3	81	15
45	7	16
12	5	14

a) The SQUARE numbers in the box are 16 and 81. [1]

3, 15, 45, 7, 12, 5 and 14 are not square numbers.

$81 = 9 \times 9$

$16 = 4 \times 4$

b) The SQUARE ROOT of 196 is 14. [1]

$\sqrt{196} = 14$

$14 \times 14 = 196$

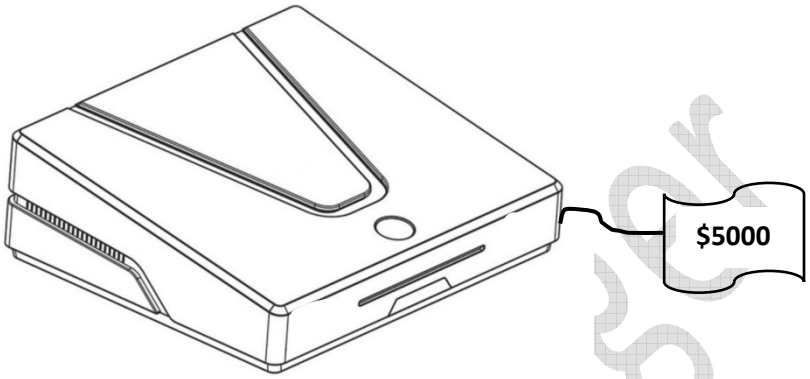
c) The TWO numbers which have a product that is equal to the SQUARE of 15 are 45 and 5. [1]

$15 \times 15 = 225$

$45 \times 5 = 225$

SECTION III

37. Nirvan saved $250 at the end of each week to buy the gaming system shown below.



a) How many weeks did it take him to save $5000? [1]

$$\text{Number of weeks he saved} = \frac{\text{Cost of gaming system}}{\text{Amount saved each week}}$$

$$= \frac{5000}{250}$$

$$= 20 \text{ weeks}$$

Answer: 20 weeks

b) He paid in cash and received a discount. After discount, he paid $4300. What was the percentage discount he received? [1]

$$\text{Discount} = \$5000 - \$4300$$

$$= \$700$$

$$\text{Percentage discount} = \frac{\text{Discount}}{\text{Original Price}} \times 100$$

$$= \frac{700}{5000} \times 100$$

$$= 14\%$$

Answer: 14%

c) Nirvan paid the cashier the EXACT $4300 which included ATLEAST one of EACH bill.

Complete the table below to find the LEAST number of bills that Nirvan gave the cashier. [2]

Bill	$100	$50	$20	$10	$5	$1
Number of bills	42	1	1	2	1	5

$42 \times \$100 = \$4200$

$1 \times \$50 = \$ \quad 50$

$1 \times \$20 = \$ \quad 20$ +

$2 \times \$10 = \$ \quad 20$

$1 \times \$5 = \$ \quad 5$

$5 \times \$1 = \$ \quad 5$

$\$4300$

Number of bills $= 42 + 1 + 1 + 2 + 1 + 5$

$= 52$ bills

Answer: 52 bills

38. The sum of every three numbers in the number pattern below forms a new number pattern.

5, 12, 19, 26, 33, 40, ...

Write the first five numbers in the new pattern and describe the pattern. [4]

First number in new pattern = 5 + 12 + 19
= 36

Second number in new pattern = 26 + 33 + 40
= 99

The second set of six terms in the sequence will be:
40 + 7 = 47
47 + 7 = 54
54 + 7 = 61
61 + 7 = 68
68 + 7 = 75
75 + 7 = 82

Third term in the new pattern = 47 + 54 + 61
= 162

Fourth term in the new pattern = 68 + 75 + 82
= 225

The next set of three terms in the sequence will be:
82 + 7 = 89
89 + 7 = 96
96 + 7 = 103

Fifth term in the new pattern = 89 + 96 + 103
= 288

The new pattern is 36, 99, 162, 225, 288, ...

Each term in the new pattern increases by 63.

$36 + 63 = 99$
$99 + 63 = 162$
$162 + 63 = 225$
$225 + 63 = 288$

Answer: 36, 99, 162, 225 and 288

39. The table below shows Reshawn's scores on four of his practice exams.

Exam	Score
1	83
2	
3	80
4	73

a) His average score on all four practice exams is 78.
How much did he score in Exam 2? [2]

Total score = Average score × Number of exams
$= 78 \times 4$
$= 312$

Score in exams 1, 3 and 4 $= 83 + 80 + 73$
$= 236$

Reshawn's score in Exam 2 $= 312 - 236$
$= 76$

Answer: 76

b) Reshawn wants to increase his average score to 80. How much does he need to score in Exam 5? [2]

$$\text{Average score} = \frac{Total\ score}{Number\ of\ exams}$$

$$\begin{aligned}\text{Total score} &= \text{Average score} \times \text{Number of exams} \\ &= 80 \times 5 \\ &= 400\end{aligned}$$

$$\text{Sum of current marks} = 312$$

$$\begin{aligned}\text{Score he needs in Exam 5} &= \text{Total score} - \text{sum of current marks} \\ &= 400 - 312 \\ &= 88\end{aligned}$$

Answer: 88

40. At a class bake sale, 20% of the cupcakes sold had were red velvet, 35% were sponge and the remaining 36 cupcakes were chocolate.

a) What percentage of the cupcakes were chocolate? [1]

Percentage of chocolate cupcakes = 100% - (20% + 35%)

= 100% - 55%

= 45%

Answer: 45%

b) How many cupcakes were sold at the class bake sale? [1]

45% of cupcakes sold = 36

Total cupcakes sold = $\frac{100}{45} \times 36$

= 80 cupcakes

Answer: 80 cupcakes

c) How many MORE sponge cupcakes than red velvet cupcakes were sold at the class bake sale? [2]

Number of red velvet cupcakes sold = $\frac{20}{100} \times 80$

= 16 red velvet cupcakes

Number of sponge cupcakes sold = $\frac{35}{100} \times 80$

= 28 sponge cupcakes

Difference = 28 – 16

= 12

12 more sponge cupcakes than red velvet cupcakes were sold at the bake sale.

Answer: 12