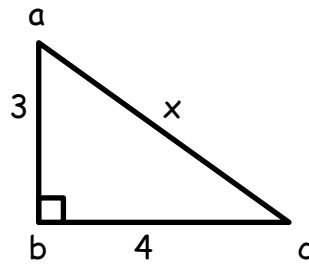Name _____ Date _____

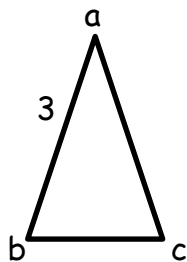# <u>Worksheet 1</u>

Look at the drawing below and then answer the following questions.

1. What is the name of this shape?

2. What is the length of the hypotenuse?

3. If $\angle a = 53°$, then $\angle c = ?$
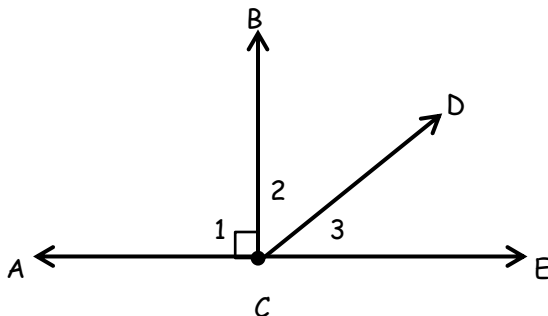
4. True or False? Side *ab* is parallel to side *bc*.

Look at the next drawing of an Isosceles Triangle and then answer the questions below.

5. What is the length of side *ac*?

6. If $\angle a = 30°$, then what are the measurements of $\angle b \ and \ \angle c$?

7. If $\angle b = 70°$, then $\angle a = ?$

Look at the drawing below and then answer the following questions.

8. Which angle is adjacent to ∠1?

9. Is ∠3 acute or obtuse?

10. Which ray is perpendicular to $\overline{AE}$?

11. If ∠3 = 45°, then ∠2 = ?

Below are the descriptions of four different Triangles. Name the triangle described.

12. This Special Triangle is the only one with a hypotenuse.

13. This Special Triangle has two 7" sides and one 3" side.

14. Every angle on this Special Triangle measures 60°.

15. A Scalene triangle that has a 95° angle.

16. Look at the map on the next page as you follow the directions given and then answer the question.

Starting in the West, take any road that runs parallel to Main Street. Stop when you are perpendicular to LaValley Rd and then make a 90° turn towards Main Street. Stop when you are perpendicular to Main Street and then turn 90° *west*. Stop when you are perpendicular to Massey Rd. Which building is adjacent to you?
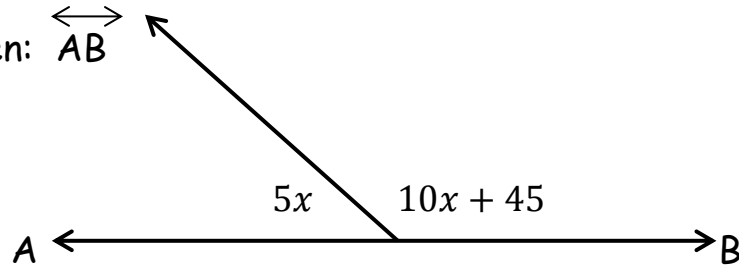
NORTH

Building A

Building B

Main Street

Building C

Massey Rd

LaValley Rd

WEST

EAST

SOUTH
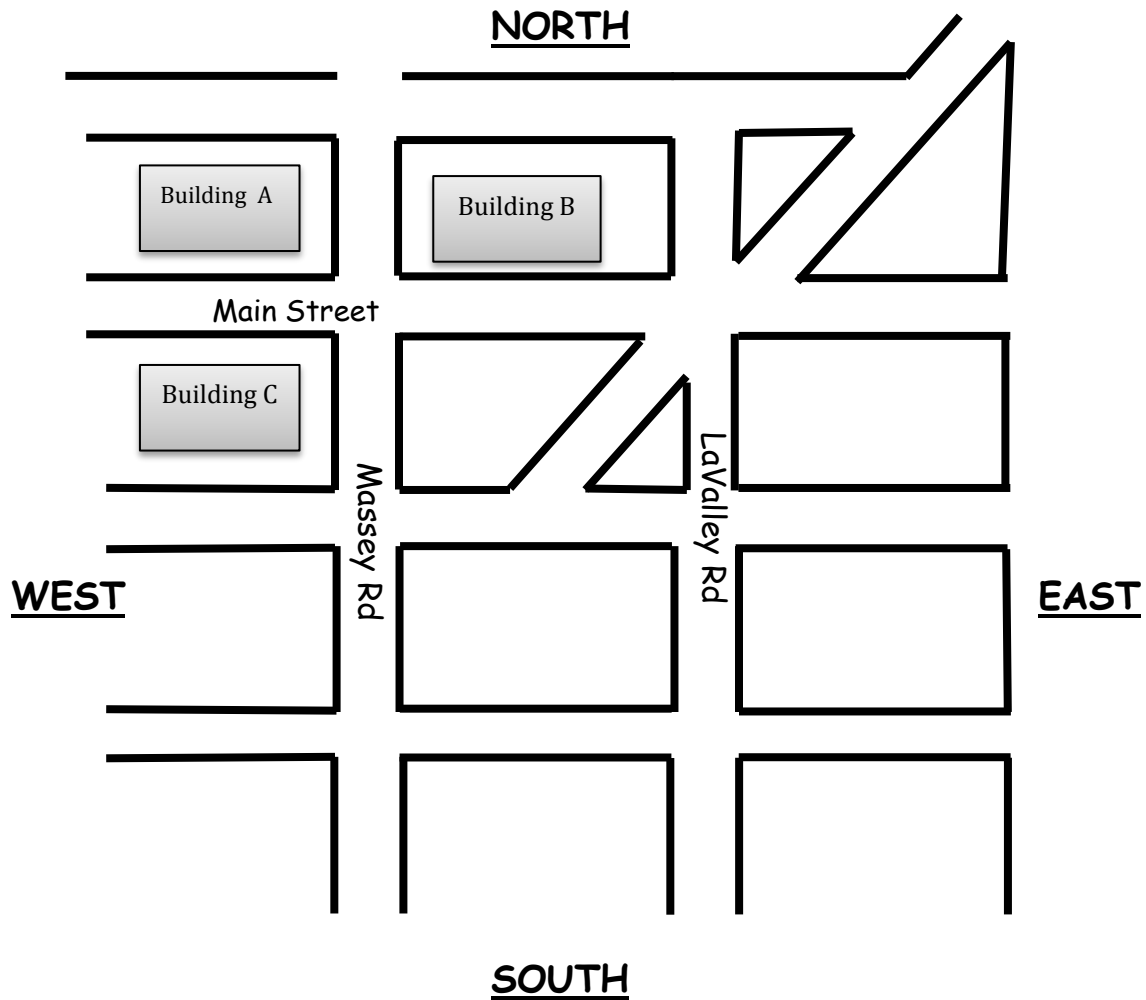
Name _____ Date _____

Solve for x.

1. Given: $\overleftrightarrow{AB}$

$5x$ $10x + 45$

A $\longleftrightarrow$ B

Solve for x in the Isosceles Triangle below.
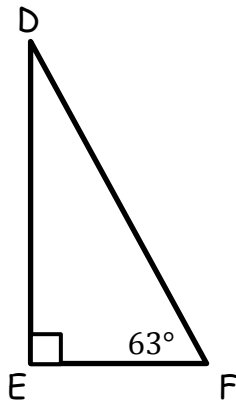
2.

$4x$

$7x$

3. Solve for x.

$x + 5$

$5x + 5^2$
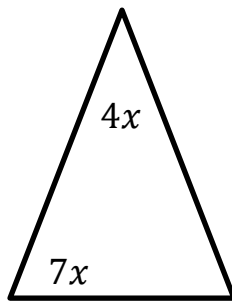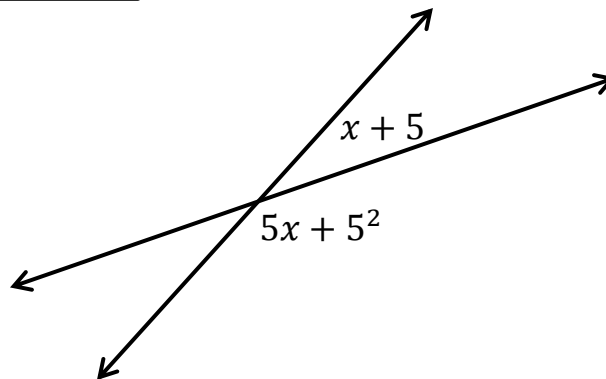
4. Solve for x.
     Given: △ABC is Equilateral.
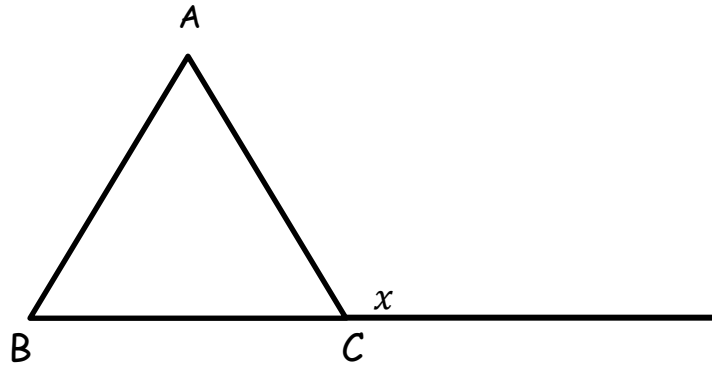
5. Given: △DEF is a Right Scalene Triangle.
     ∠D is complementary to $\angle F$.

$\angle D = ?$

6. Solve for x.
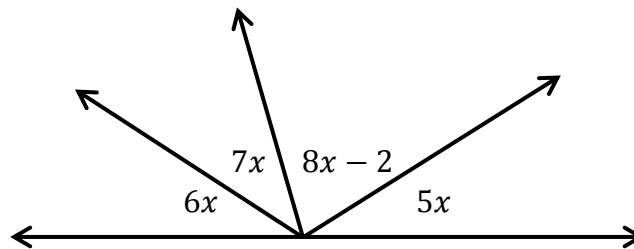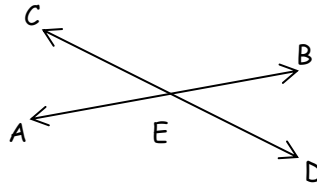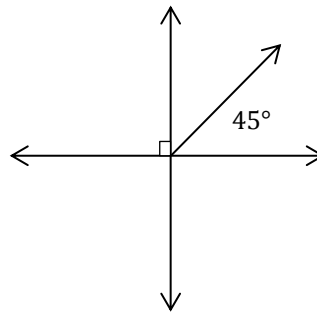
Use the facts listed on the Smart Card to answer problems 7 and 8. List the theorems that will prove you are right.

7. Given: ∡AEC is complementary to ∡DEB
   Name the measurement of all four angles.

C
B
A   E
D

_____

_____

8. Name the measurement of every angle in the drawing below.

45°

_____

Nia is a Graphic Designer. She is asked to paint the logo below onto a window for First Hand Industries. All horizontal lines are parallel and so are the vertical lines. She is given the first angle measurement.   Name the size of every angle in the logo, there are 37 angles in total. You can use symbols to mark the angles.

120°

FHI

Name _____ Date _____

1. $\angle a$ is complimentary to $\angle b$
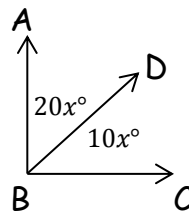 $\angle a = 3x$
   $\angle b = (x - 10)$
   Solve for x.

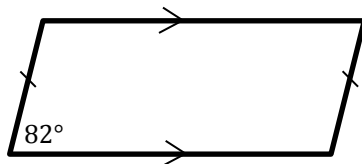2. $\angle d$ is supplementary to $\angle e$
   $\angle d = (5x + 10)$
   $\angle e = 12x$
   Solve for x.

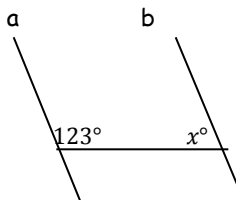3. Adjacent angles ABD and DBC are drawn below. Their exterior sides form perpendicular lines. Solve for x.

A
D
$20x°$
$10x°$
B   C

4. Find the measurement of the other three angles in the shape below.

$82°$

5. $A \parallel B$

   $x =$

   a   b

   $123°$ $x°$

6. ∡p is supplementary to ∡q
    ∡p ≅ ∡q
    ∡p =
    ∡q =

Write the theorem that proves your answer.

_____

7. *line h ⊥ line k*
    Solve for x.
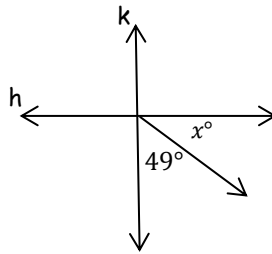
8. *line a ∥ line b*
    Solve for x.
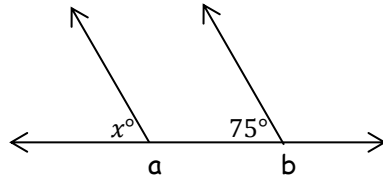
Write two theorems to prove your answer.
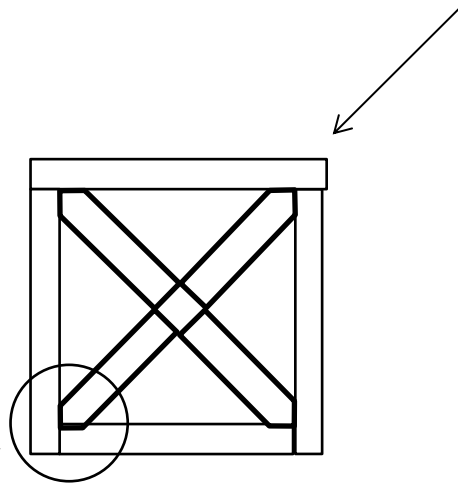
_____
_____
_____

9. ∠1 *is supplementary to* ∠2
    ∠3 *is supplementary to* ∠2
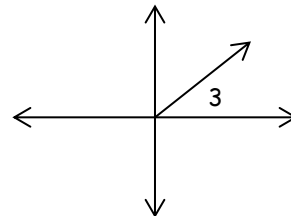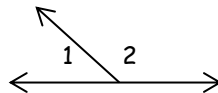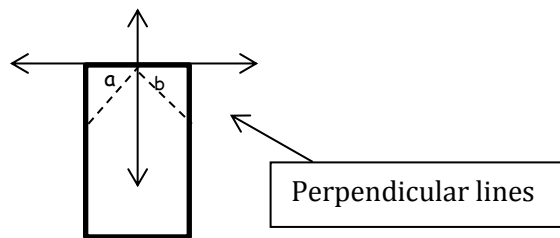

Which theorem proves that ∠1 ≅ ∡3?

10. John Richard is building a barn door like the one in the drawing below. The sides of the door are made with two pieces of lumber lying perpendicular to each other.

But the cross boards are going to require some special cutting. The ends of the cross boards will need to look something like this in order to fit properly.
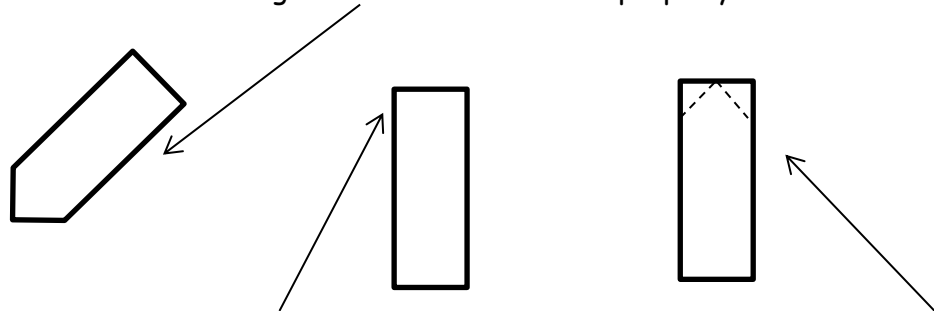
Right now the board looks like this, so John Richard is going to cut the board on the dashed lines. He needs both cuts to be the same length so the board will fit into the corners of the perpendicular boards. Look at the drawing below and use your geometry skills to figure out the measure of angles a and b.
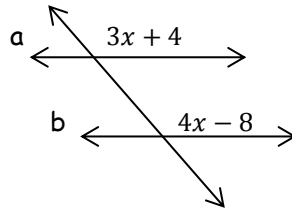
a   b

Perpendicular lines

Name _____ Date _____

Solve for x.

1. Given: *Line a ∥ b*

   $3x + 4$

   a

   b $4x - 8$

2. Given: *Line c ∥ d*

   $6x$ c

   $12x$

   d

3. Given: *Line e ∥ f*

   e   f

   $10 + 2x$

   $3x - 4$

4. Given: $g \perp h$

   $\measuredangle jkh = 20°$

   g

   j

   $x°$

   h   k
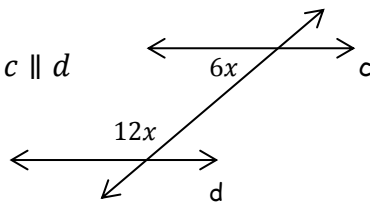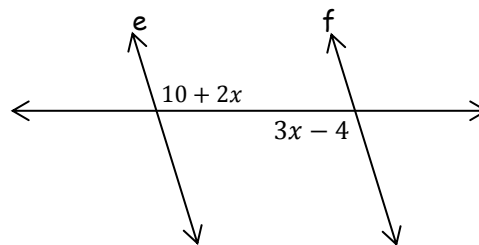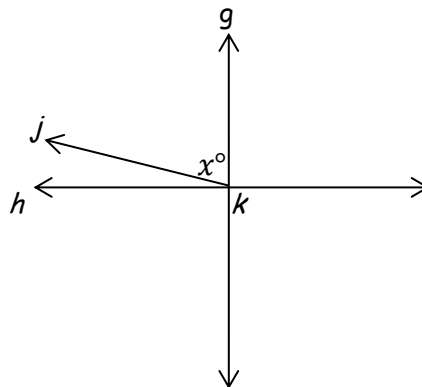
5. State the measurement of each angle.

Given: $\angle 1 = 65°$
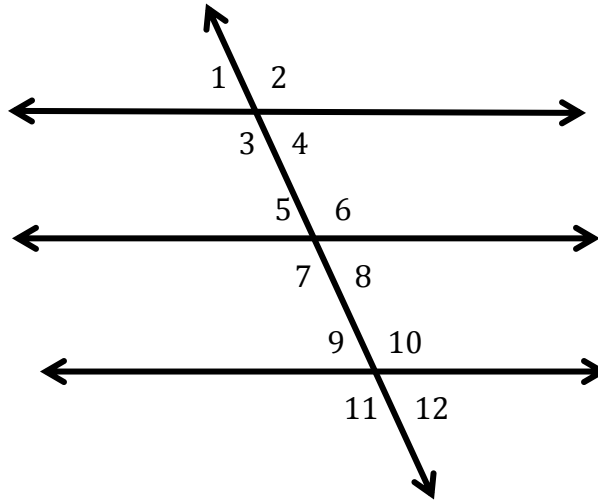
$\angle 2 =$ $\angle 3 =$ $\angle 4 =$ $\angle 5 =$ $\angle 6 =$ $\angle 7 =$ $\angle 8 =$

$\angle 9 =$ $\angle 10 =$ $\angle 11 =$ $\angle 12 =$

6. Are angles 1 and 2 congruent, in the drawing below?

Given: $a \parallel b$

Which theorem proves your answer? Write out the entire theorem.

_____

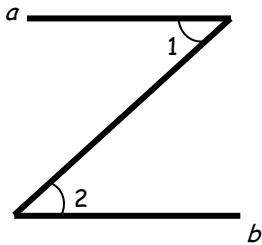7. Name the type of congruent angles in each drawing. Answer the next three questions as either Alternate Interior, Alternate Exterior, or Corresponding angles.
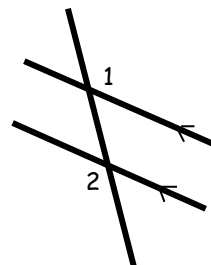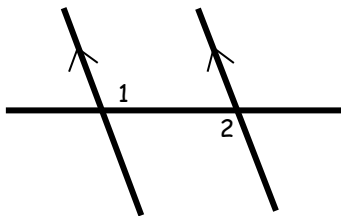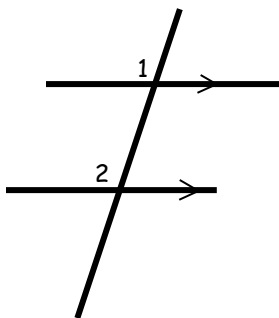
a). _____ b). _____ c). _____

8. Find the measure of $\angle 2$.

 Given: $\angle 1 = 73°$

  $a \parallel b$

9. Find the measure of $\angle 3$.

 Given: $c \parallel d$

  $\angle 4 = 55°$

10. Solve for x.

$2x + 3$

$3x - 47$
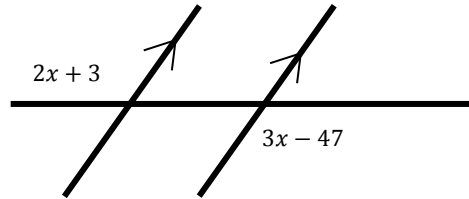
11. Find the measure of $\angle 5$.

1 2 3 4 5 6 7 8 9 10

98°
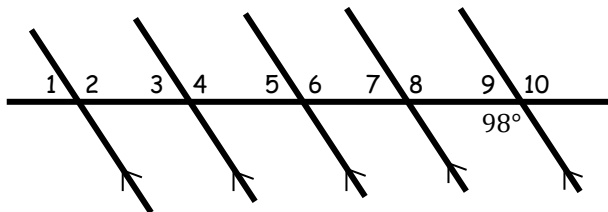
12. A quilt is a type of blanket created by sewing several small pieces of material together to create one big blanket. Sierra is pl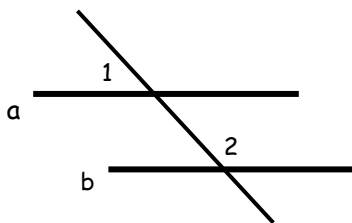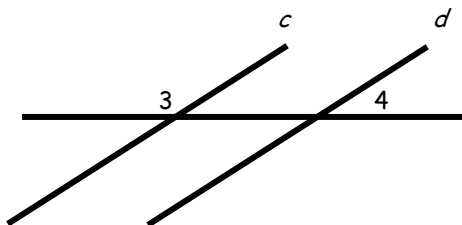anning to sew a quilt in the pattern below. Mark every congruent obtuse angle on the pattern, using the arc symbol ⌒. All lines are parallel.
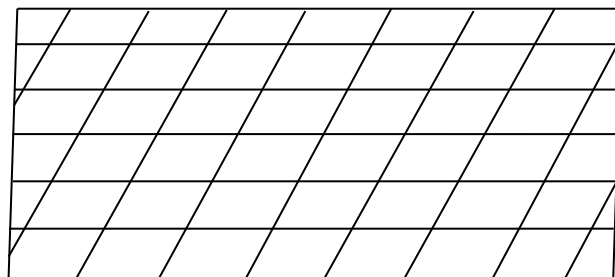
13. Ethan is a Transportation Engineer. His boss has asked him to design a parking lot for a convenient store. He has drawn it below. Which of the following pairs of angles are the only possible measurements of angles 1 and 2?

1 2

a) 45° and 90°   b) 55° and 95°   c) 85° and 85°   d) 60° and 120°

Name _____ Date _____

Worksheet 5 page 1 of 1

For each problem you will be given an equation. I will make a change to each equation. Write the Property that will prove the new equation is still equal. The first one is done for you.

1. $5 = 5$
     $5 - 4 = 5 - 4$ **Subtraction Property**

2. $\angle F = \angle G$
     $\angle F \cdot \frac{1}{2} = \angle G \cdot \frac{1}{2}$ _____

3. $XY = XY$
     $AB + XY = XY + AB$ _____

4. $4 + 3 = YZ$
        $7 = YZ$ _____

5. $\angle ABC = \angle DEF$
    $\angle ABC - \angle ABX = \angle DEF - \angle ABX$ _____

For problems 6 – 10, name the property that proves the statement of equality or congruence is true.

6. $\angle A = \angle A$ _____

7. $a = b \text{ and } a = c, so\ b = c$ _____

8. $DF = FG,\ so\ FG = DF$ _____

9. $\angle A = 30° + 60°, so\ \angle A = 90°$ _____

10. $RB = PQ, so\ \frac{1}{2}RB = \frac{1}{2}PQ$ _____

11. What is the special name given to the equation in problem #10?

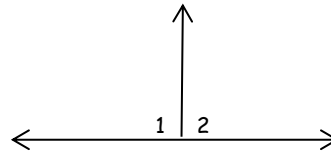   _____

Name _____ Date _____

1. The left side of a Formal Proof is where you list your facts or beliefs. The right side is limited to five different types of statements. Name the five different types.

_____ _____ _____

_____ _____

2. Complete the Formal Proof in the proper format.

Given: ∠1 ≅ ∠2

Prove: ∡2 = 90

STATEMENT	REASON
1. ∠1 ≅ ∠2	1.
2. ∠1 and ∠2 are supplementary.	2.
3.	3. Angles that are both congruent and supplementary are each a right angle.
4. ∡2 = 90	4.

3. Given: $\overline{AB} \parallel \overline{CD}$
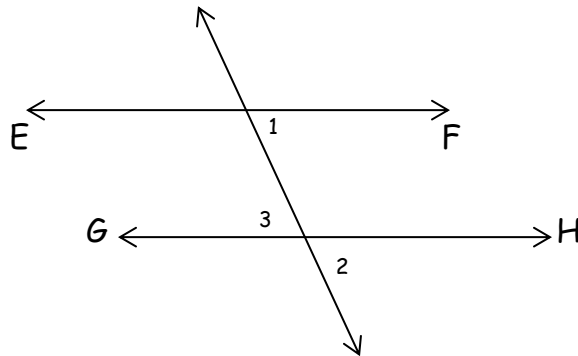
   Prove: ∠1 and ∠3 are supplementary.
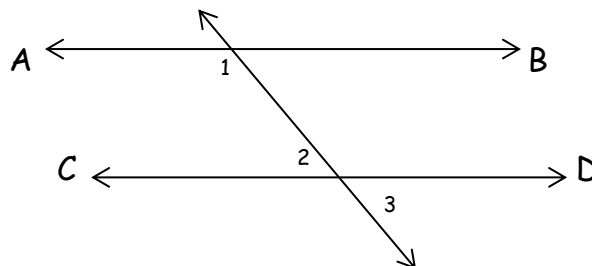
Enter the Reasons in the formal proof on the next page.

STATEMENT	REASON
1. $AB \parallel CD$	1.
2. $\angle 1 + \angle 2 = 180$.	2.
3. $\angle 2 = \angle 3$	3.
4. $\angle 1 + \angle 3 = 180$	4.
5. $\angle 1$ and 3 are supplementary	5.

4. Given: $EF \parallel GH$

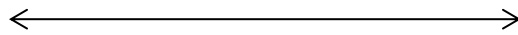   Prove: $\angle 1 = \angle 3$

Complete the Proof below.

STATEMENT	REASON
1.	1. Given.
2. $\angle 1 \cong \angle 2$	2.
3. $\angle 1 = \angle 2$	3.
4. $\angle 2 = \angle 3$	4.
5.	5.

Name _____ Date _____

<u>Chapter One Review Test</u> _{page 1 of 4}

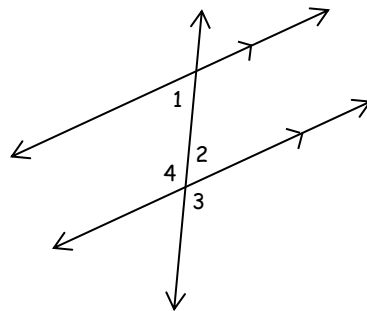1. Below I have drawn point A and a line. Draw as many lines as possible that are both parallel to the line AND go through the point.

A
•

⟵――――――――――――――――⟶

2. Look at the drawing for problem number 1. How many lines can you draw that are both perpendicular to the line and pass through point A?

3. Write the theorem that proves angles 1 and 2 below are congruent.

_____

4. Look at the drawing for problem number 3. If ∡1 = 60, then ∡3 = _____

5. Look at the drawing for problem number 3. If ∡2 = 63, then ∡4 = _____

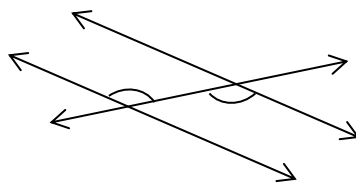6. Look at the drawing for problem number 3. If ∡4 = 114, then ∡1 = _____

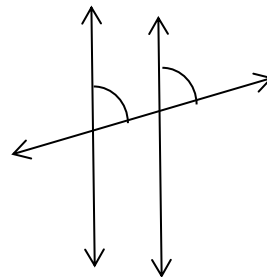7. Look at the drawing for problem number 3. If ∡4 = 120, then ∡3 = _____

8. Below are three different sets of parallel lines with a transversal. Each set has two marked angles. Name the congruent angles pairs as either Alternate Interior, Alternate Exterior, Corresponding or Vertical angles.
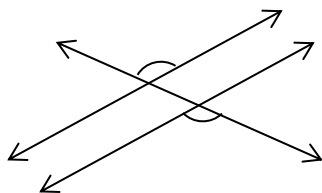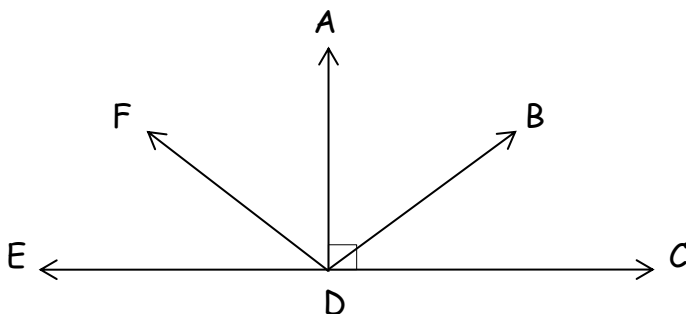
a). _____   b). _____   c). _____

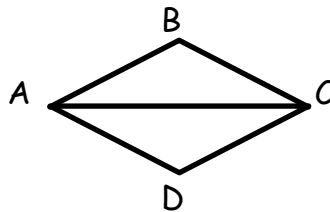Look at the drawing below and then answer the following questions.

9. Write the theorem that proves ∠ADF and ∠FDE are complementary.

_____

10. Write the theorem that proves ∠ADE and ∠ADC are supplementary.

_____
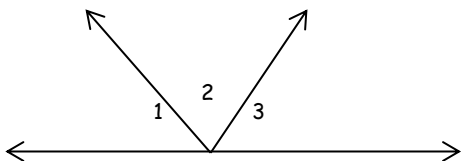
11. If two angles are both congruent and complementary. What is the measure of each angle? _____

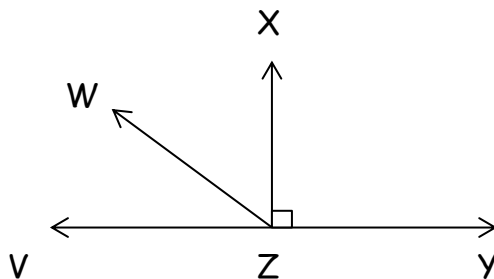12. In the drawing below, $AC = AC$. Which property proves that statement of equality? _____

13. In the drawing below, $\angle 1 = \angle 2$ and $\angle 2 = \angle 3$. Which property proves that $\angle 1 = \angle 3$? _____

14. If angles 1, 2, and 3, in the drawing above, are congruent, then what is the only possible measurement for $\angle 2 =$ _____.

15. Use the Angle Addition Postulate to write three true equations about the angles below.

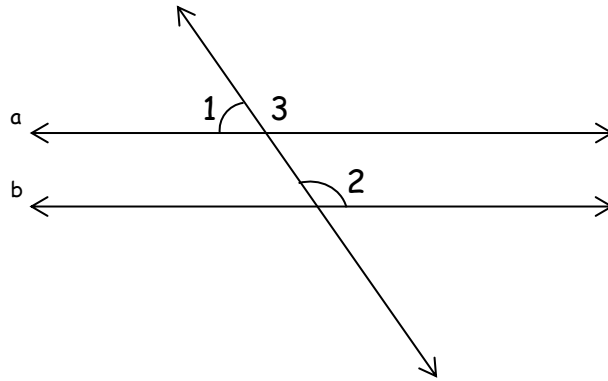16. Look at the drawing above and solve for x. $\angle VZW = 6x + 2$, $\angle WZX = 5x$

17. In the drawing above, which two angles are supplementary? _____

Complete the proof below.

Given: $\angle 1$ *is supplementary to* $\angle 2$

Prove: $a \parallel b$

1. $\angle 1$ *and* $\angle 2$ *are supplementary*	1.
2. $\angle 1 + \angle 2 = 180$	2.
3. $\angle 1$ *and* $\angle 3$ *are supplementary*	3.
4. $\angle 1 + \angle 3 = 180$	4.
5. $\angle 2 \cong \angle 3$	5.
6. $a \parallel b$	6.