Name: _____

NOTES

ASSIGNMENT

GEOMETRY

LINES, ANGLES, TRIANGLES, AND MORE

Real-World!

130°
Franklin Way
Chavez Ave
a   40°

P   T   Q

R   S   U

The "why"!

3
1   2

2   3
1
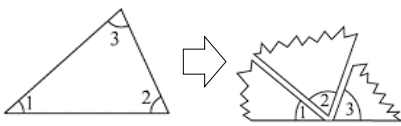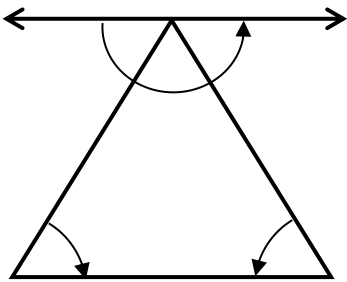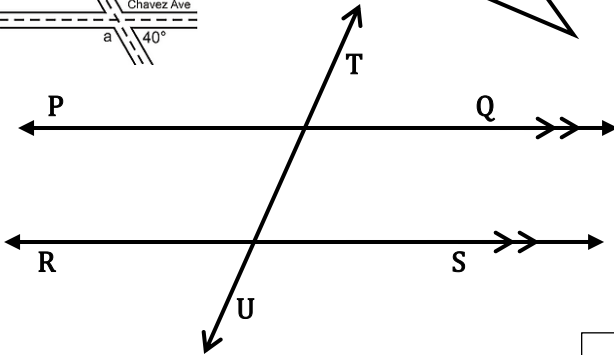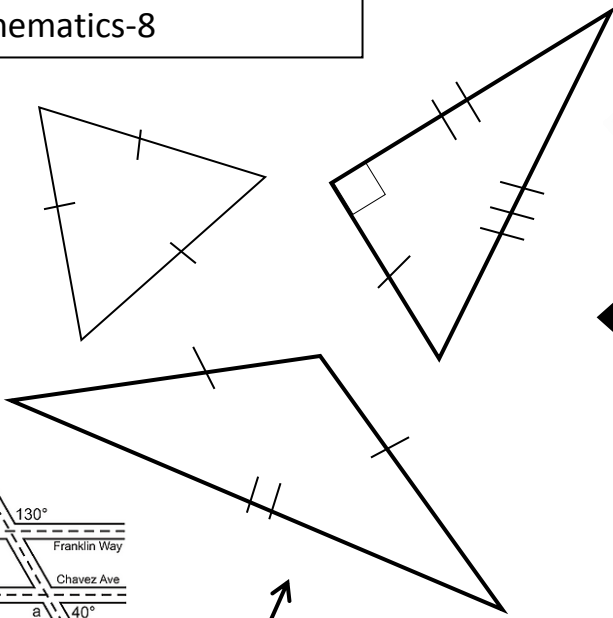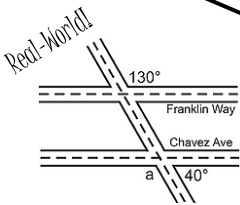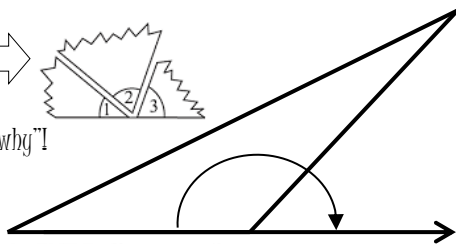
- I can define key terms and identify types of angles and adjacent angles.
- I can measure angles.
- I can identify vertical, supplementary and complementary angles.
- I can determine the measure of an interior angle of a triangle given two angle measurements.
- I can determine an interior angle of a triangle given an interior and exterior angle measurement.
- I can use the angle relationships involving parallel lines and transversals to determine the measures of corresponding angles, alternate interior angles, alternate exterior angles.
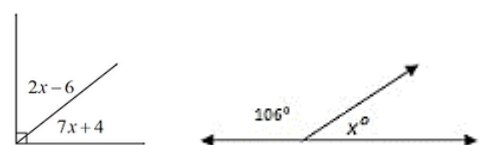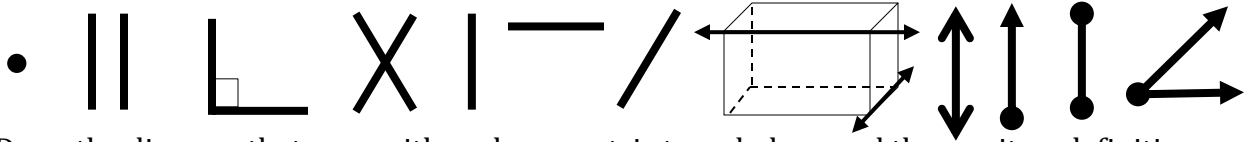
EQUILATERAL
ISOSCELES
SCALENE
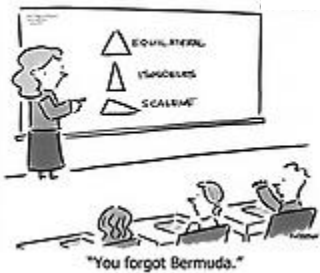
"You forgot Bermuda."

True story!

b
a   c   d

a+b+c = 180°
d+c = 180°
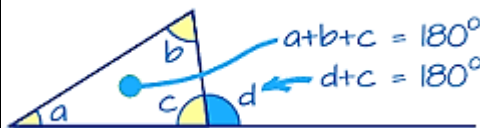
What equation would you write?

$2x - 6$
$7x + 4$

$106°$ $x°$

NOTES

Lines Segments, and Rays

Draw the diagram that goes with each geometric term below, and then write a definition.

Angle		
Diagonal line segment		
Horizontal line segment		
Intersecting line segments		
Line		
Line segment		
Parallel		
Perpendicular		
Point		
Ray		
Skew		
Vertex (Vertices is plural)		
Vertical line segment		

Angles

Angles are made up of two rays with a common endpoint, called the vertex. Rays are named starting with the endpoint and then another point on the ray. Ray $\overrightarrow{BA}$ and ray $\overrightarrow{BC}$ share a common endpoint (B). Notice that both rays are named starting with B.
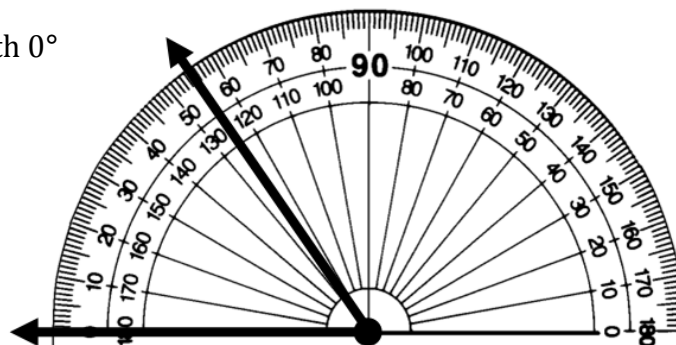
Point **B** is called the:

_____
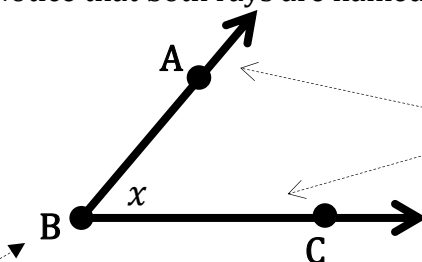
The sides of the angle are:

_____   and   _____

A

x

B

C

Angles are usually named by three capital letters. The middle letter names the _____. If only one angle is located at a vertex, then the angle can be named using the vertex letter alone. And if there is a lower case letter (or a number) between the two sides, the angle can also be referred to using the lower case letter (or number).
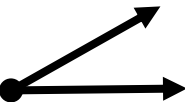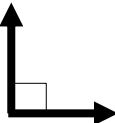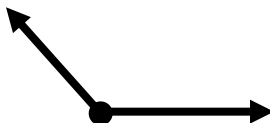
The angle above can be named: _____   _____   _____   _____

ANGLE MEASURES A protractor is used to measure angles. The protractor is divided evenly into a half circle of 180 degrees (180°). When the middle of the bottom of the protractor is placed on the vertex, and one of the rays of the angle is lined up with 0°, the other ray of the angle crosses the protractor at the measure of the angle.

The angle below has the ray pointing left lined up with 0° (the outside numbers), and the other ray of the angle crosses the protractor at 55°.
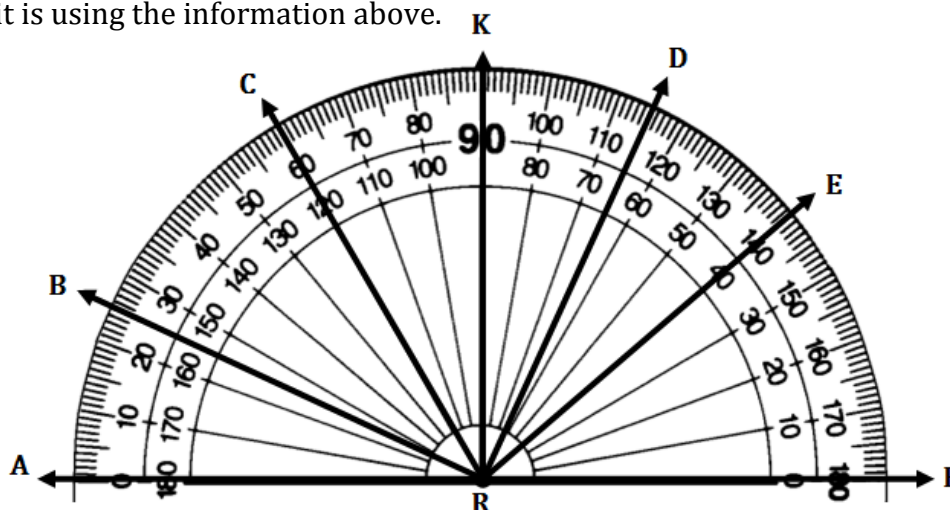
Types of Angles

Type _____

Measure

Type _____

Measure

Type _____

Measure

Type _____

Measure

Using the protractor below, find the measure of the following angles. Then, tell what type of angle it is using the information above.

#	Question	Measure	Type of Angle
1	What is the measure of ∡ARF?		
2	What is the measure of ∡CRF?		
3	What is the measure of ∡DRF?		
4	What is the measure of ∡ARD?		

Adjacent Angles

Adjacent Angles - Adjacent angles are two angles that have the same vertex and share one ray as a side. They *do not* share space inside the angles.
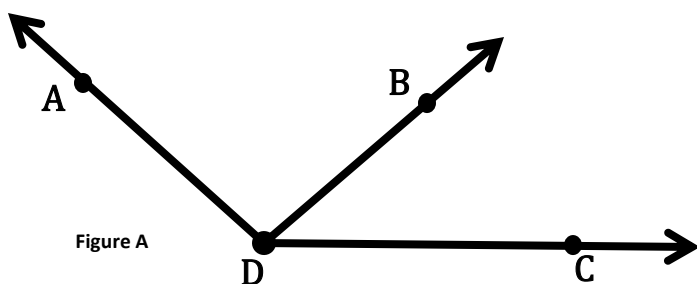

Figure A

Figure B

Figure C

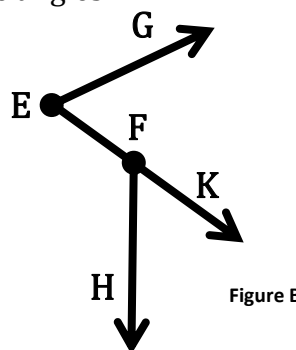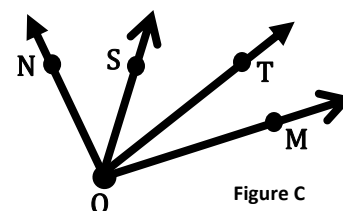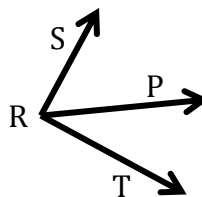| **Figure A)** ∡ADB **is adjacent to** ∡BDC. However, ∡ADB is **not** adjacent to ∡ADC because adjacent angles *do not* share any space inside the angle.	**Figure B)** These two angles are not adjacent. They share a common ray but do not share the same vertex.	**Figure C)** ∡NOT is not adjacent to ∡SOM because they share space inside of the two angles. (overlap)

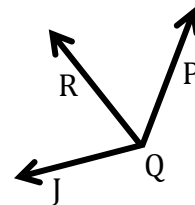For each diagram below, name the angle that is adjacent to it.
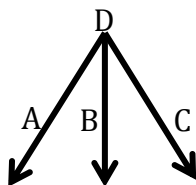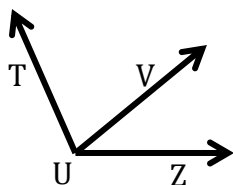
1) ∡CDB is adjacent to ∡_____	2) ∡TUV is adjacent to ∡_____	3) ∡SRP is adjacent to ∡_____	4) ∡PQR is adjacent to ∡_____

Independent Practice

Part 1: Circle the correct choice for each question.

(1) Which of the following is not a point on $\overleftrightarrow{AC}$?

  (Y) B   (R) D   (V) A

(2) Which of the following is not a correct name for this line?

  (A) $\overrightarrow{PQ}$ (L) $\overleftarrow{QP}$ (G) $\overleftrightarrow{PQ}$

(3) Which of the following is not the name of a segment in this figure?

  (O) $\overline{RS}$ (T) $\overrightarrow{ST}$ (H) $\overline{TR}$

(4) Which of the following is not the name of a ray in this figure?

  (W) $\overrightarrow{EG}$ (S) $\overrightarrow{FG}$ (U) $\overrightarrow{FE}$

(5) Which of the following is not a correct name for this angle?

  (I) ∠ACB   (Y) ∠CBA   (L) ∠B

(6) Which of the following is not the name of a line in this figure?

  (G) $\overleftrightarrow{ZX}$ (R) $\overleftrightarrow{XY}$ (K) $\overleftrightarrow{YZ}$

(7) Which of the following is a segment that has *B* as an endpoint?

  (N) $\overline{CD}$ (C) $\overline{AC}$ (T) $\overline{CB}$

(8) Which of the following is *not* the name of a ray in this figure?

  (H) $\overrightarrow{MO}$ (S) $\overrightarrow{LM}$ (P) $\overrightarrow{KO}$

(9) Which of the following is not a correct name for an angle in this figure?

  (M) ∠H   (A) LGHF   (D) ∠EHG
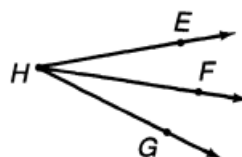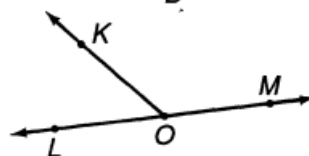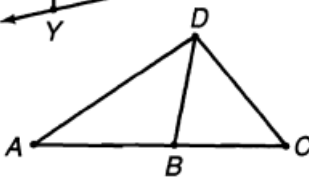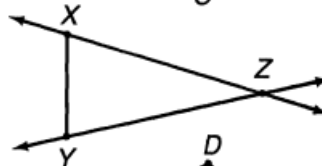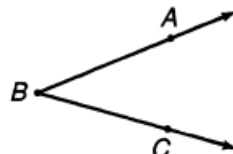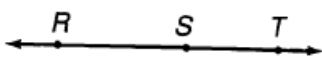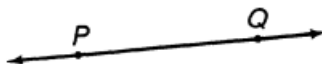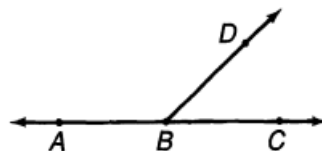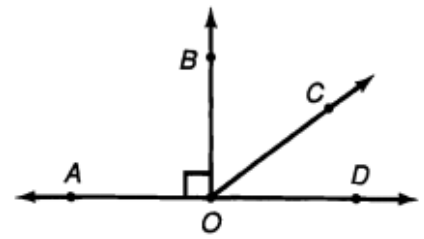
**Part 2: Fill in the blanks with the correct geometric term.**

1) The figure formed by two rays from the same endpoint is an _____

2) The intersection of the two sides of an angle is called its _____

3) The vertex of ∢COD in the drawing above is point _____

4) The instrument used to measure angles is called a _____

5) The basic unit in which angles are measured is the _____

6) ∢AOB has a measure of 90° and is called a _____ angle.

7) An angle whose measure is between 0° and 90° is an _____ angle.

8) Two acute angles in the figure are ∢BOC and _____

9) An angle whose measure is between 90° and 180° is an _____ angle.

10) An obtuse angle in the figure is _____

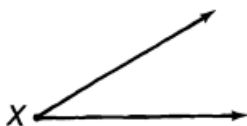**Part 3: Find the measure of each angle.**
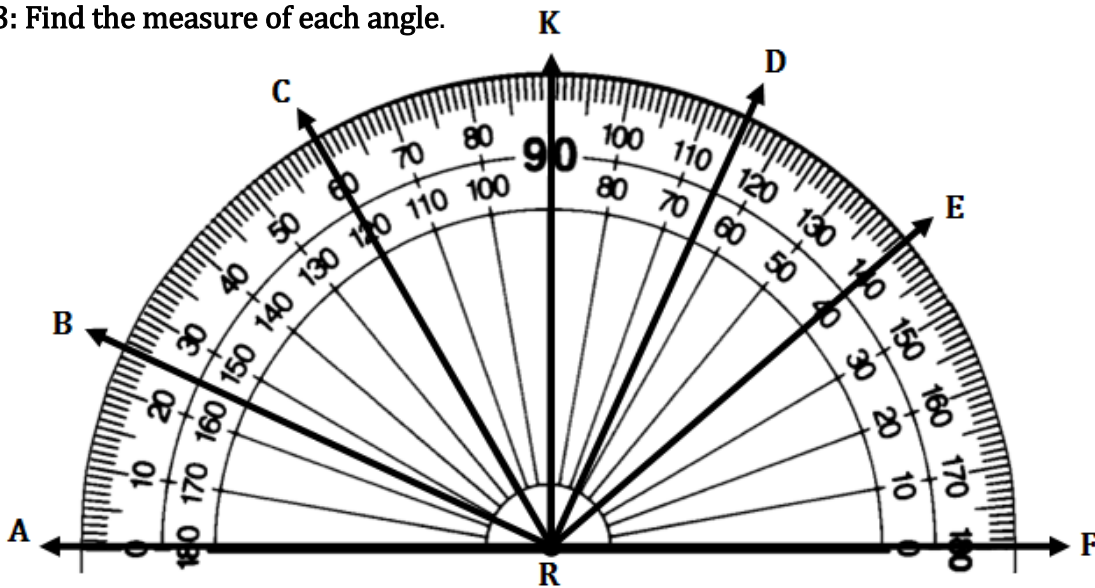
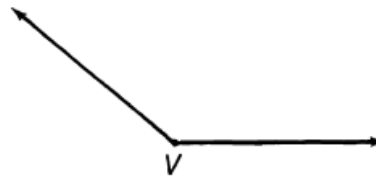| #	Question	Measure	Type of Angle
1	What is the measure of ∢BRF?		
2	What is the measure of ∢ERF?		
3	What is the measure of ∢ARB?		
4	What is the measure of ∢KRA?		
5	What is the measure of ∢CRA?		
6	What is the measure of ∢FRA?		

ASSIGNMENT

Part 4: For each angle, circle the best estimate.
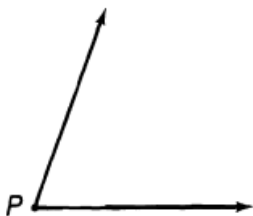
(1) m∠P is about
   35°   70°

(2) m∠X is about
   65°   30°

(3) m∠V is about
   140°   95°
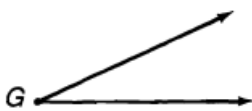
(4) m∠G is about
   55°   25°
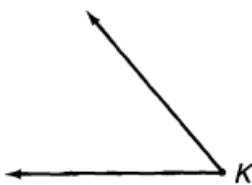
(5) m∠K is about
   50°   80°
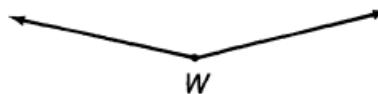
(6) m∠W is about
   155°   110°
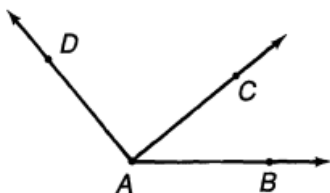
(7) m∠BAC is about
   40°   15°
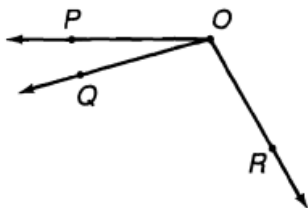
(8) m∠CAD is about
   65°   90°
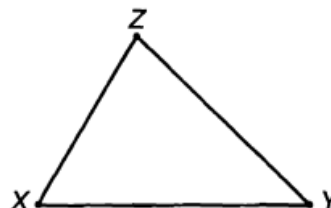
(9) m∠BAD is about
   100°   130°

(10) m∠POR is about
   160°   120°

(11) m∠POQ is about
   40°   15°

(12) m∠QOR is about
   105°   140°

(13) m∠X is about
   35°   60°

(14) m∠Y is about
   45°   25°

(15) m∠Z is about
   75°   40°

Part 5: For each diagram below, name the angle that is adjacent to it.

1) ∡YOP is adjacent

to ∡_____

2) ∡XVY is adjacent

to ∡_____

3) ∡DCF is adjacent

to ∡_____

4) ∡JKL is adjacent

to ∡_____

Vertical Angles … be careful!

When two lines intersect, **two pairs** of **VERTICAL ANGLES** are formed. Vertical angles are <u>not</u> adjacent. Vertical angles are located across from each other, they share a common vertex, and the sides of the angles are composed of opposite rays.

Use a straight edge.
Draw ray $\overrightarrow{OC}$ opposite to ray $\overrightarrow{OB}$, and then draw ray $\overrightarrow{OA}$ opposite to ray $\overrightarrow{OD}$.

Use what you've learned about the measure of straight angles to prove that the figure contains two pairs of congruent angles.
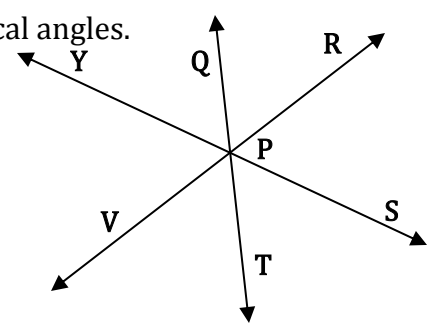
∡BOD ≅ ∡ _____

∡BOA ≅ ∡ _____

B

45°

O

D
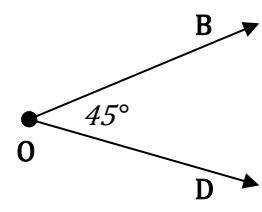
Pairs of vertical angles always have the same measure.

Vertical angles are _____ (symbol hint ≅)

Congruent means they have the _____ _____.

Set A: In the diagram, name the second angle in each pair of vertical angles.

1) ∡YPV _____

4) ∡VPT _____

2) ∡QPR _____

5) ∡RPT _____

3) ∡SPT _____

6) ∡VPS _____

Y   Q   R
P
V
T   S

Set B: Use the information given in the diagram to find the measure of each unknown vertical angle.
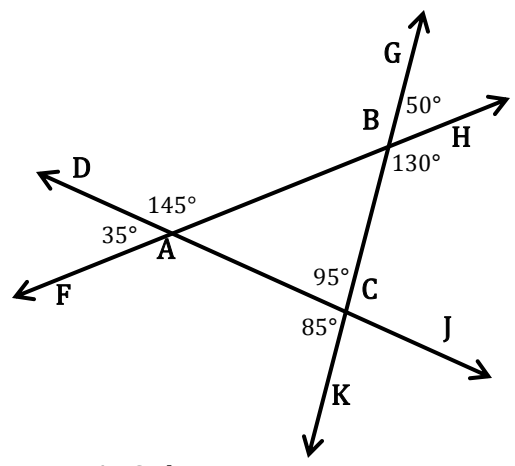
Set B Questions

1) m∡ CAF = _____

2) m∡ ABC = _____

3) m∡KCJ = _____

4) m∡ABG = _____

5) m∡BCJ = _____

6) m∡CAB = _____

G
B 50°
H
130°
D
145°
35°
A
F
95° C
85°
J
K

7) Figure ABC above is a _____

8) The proper notation for the figure is _____

9) The sum of the angles in figure ABC is _____ + _____ + _____ = _____

Complementary and Supplementary Angles

How to remember?

A B C D E F G H I J K L M N O P Q R S...

Two angles are **complementary** if the sum of their angles measure 90°.

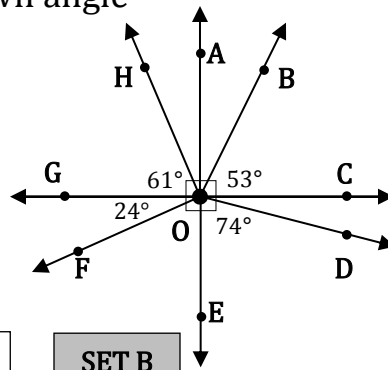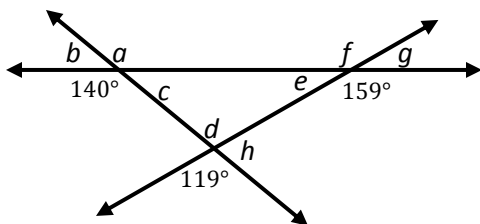Two angles are **supplementary** if the sum of their angles measure 180°.

Complementary and supplementary angle pairs *may be* adjacent, but *do not need to be*.

A **linear pair** is a pair of <u>adjacent angles</u> that are supplementary.
Below, the angles marked 32° and 148° are a linear pair.

Together, these angle pairs form a _____ _____.

Sum =

35°
55°

23°

67°

Sum =

Sum =

Sum =

45°   45°

These angles are:

_____

148°
32°

Sum =

Sum =

Sum =

70°   110°

These angles are:

_____

PRACTICE: Calculate the measure of each unknown angle

b a
140° c
     d
      h
   119°

f g
e 159°

H   •A   B

G   61° 53°   C
24°
   O   74°

F   D

•E

The sum of <u>all</u> the central angles =

SET A	The sum of angles e + d + c =

1) m∡ *a* = _____   5) m∡ *e* = _____

2) m∡ *b* = _____   6) m∡ *f* = _____

3) m∡ *c* = _____   7) m∡ *g* = _____

4) m∡ *d* = _____   8) m∡ *h* = _____

SET B

9) m∡ AOB = _____

10) m∡ COD = _____

11) m∡ EOF = _____

12) m∡ AOH = _____

ASSIGNMENT

Independent Practice

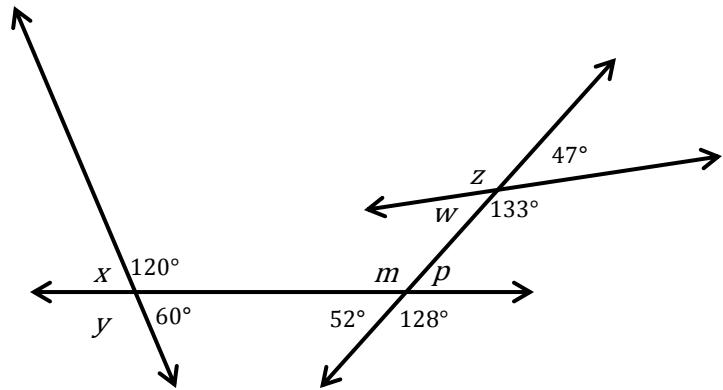Part 1: In the diagram below, name the second angle in each pair of vertical angles.

Set A

1) ∡MLN _____   4) ∡GLM_____

2) ∡KLH _____   5) ∡KLM _____
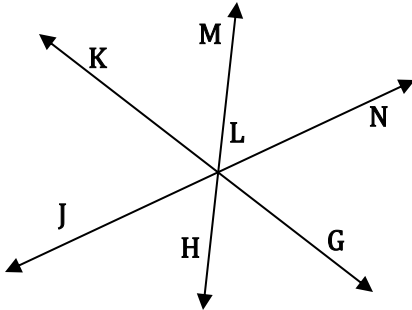
3) ∡GLN_____   6) ∡HLG _____

Set B

Use the information given in the diagram to find the measure of each unknown vertical angle.

7) m∡ x = _____

8) m∡ y = _____

9) m∡ z = _____

10) m∡ w = _____

11) m∡ m = _____

12) m∡ p = _____

13) ∡x + ∡y = _____

14) ∡m + ∡p = _____

15) ∡w + ∡z = _____

16) Each of the angle pairs in questions 13-15 above are _____ angles because

their sum is _____.

17) The sum of the **four** angles located around every point in the figure above = _____

ASSIGNMENT

Part 2:

I. Complete each statement.

(1) Two angles are **complementary** if the sum of their measures is _____.

(2) Two angles are **supplementary** if the sum of their measures is _____.

(3) The **complement** of a 30° angle has a measure of _____.

(4) The **supplement** of a **65°** angle has a measure of _____.

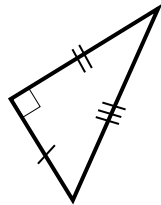II. Find the measure of each numbered angle.
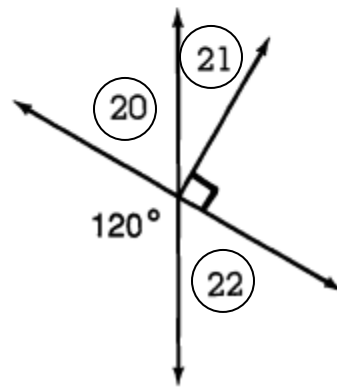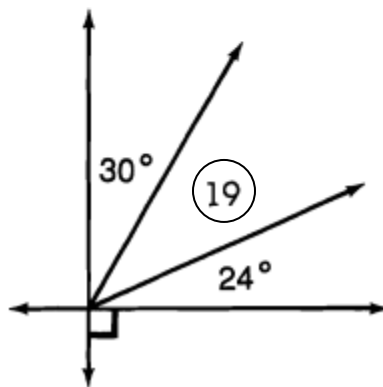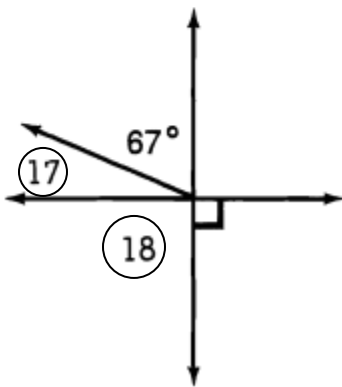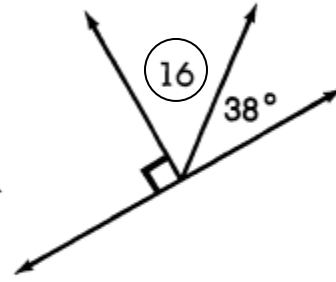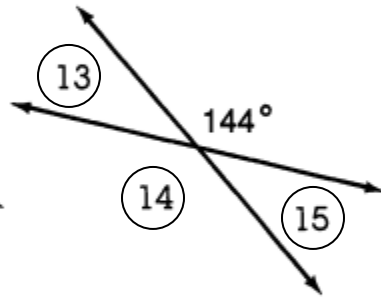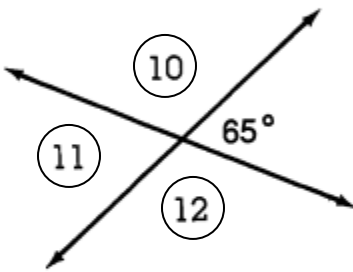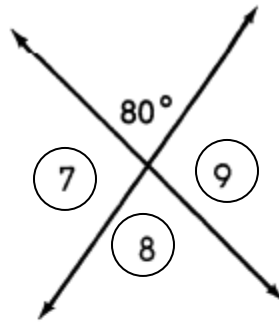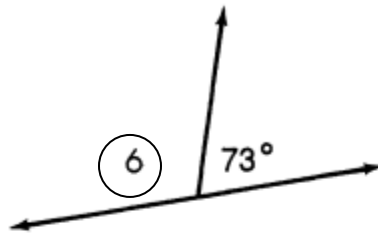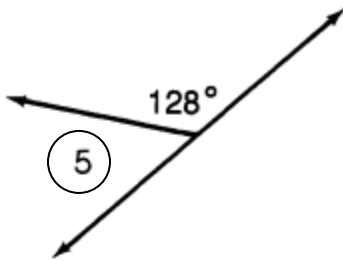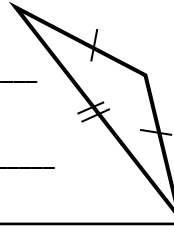
Review: Lines and Angles

Notes: Identify each type of triangle by its angles and by its sides
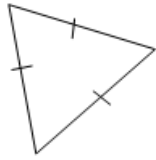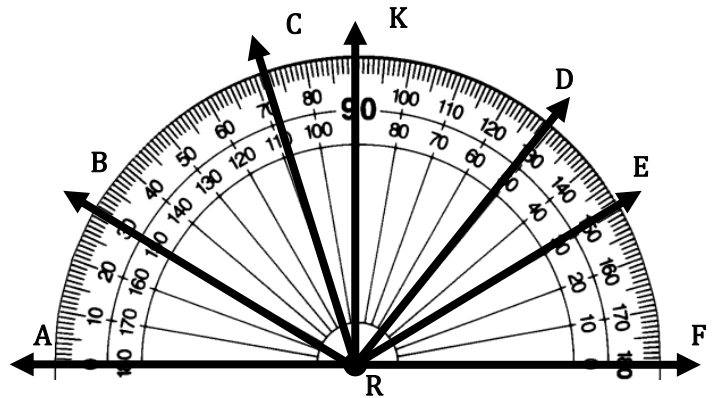
By sides: _____
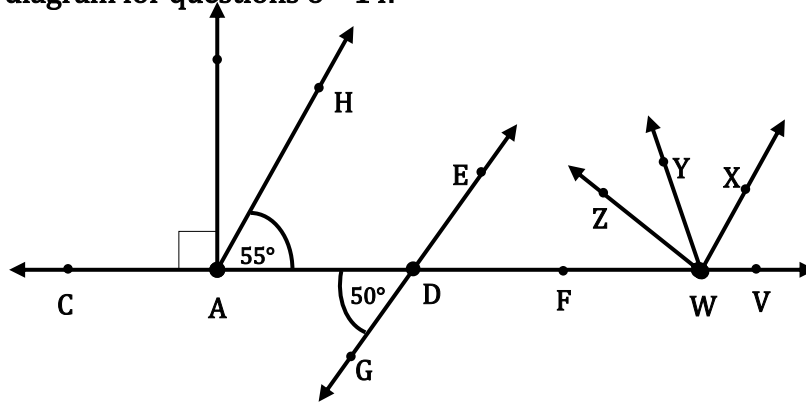By angles: _____

By sides: _____
By angles: _____

By sides: _____
By angles: _____

Part 1: Find the measure of the angles below.

1) What is the measure of ∡DRA? _____

2) What is the measure of ∡CRF? _____

3) What is the measure of ∡ARB? _____

4) What is the measure of ∡CRB? _____

5) What is the measure of ∡KRC? _____

Use the following diagram for questions 6 – 14.

6) Which angle is supplementary angle to ∡EDF? _____

7) What is the measure of ∡GDF? _____

8) Which two angles are right angles? _____ and _____

9) What is the measure of ∡EDF? _____

10) Which angle is adjacent to ∡BAD? _____

11) Which angle is a complementary angle to ∡HAD? _____

12) What is the measure of ∡HAB? _____

13) What is the measure of ∡CAD? _____

14) Which angles are adjacent to ∡EDA?

_____ and _____

ASSIGNMENT

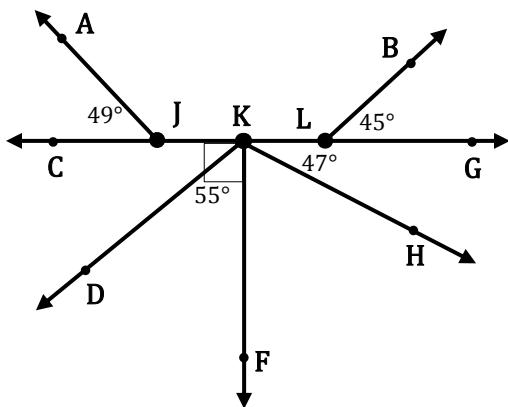**Part 2: Use what you know about complementary and supplementary angles to find the measures of the following angles.**
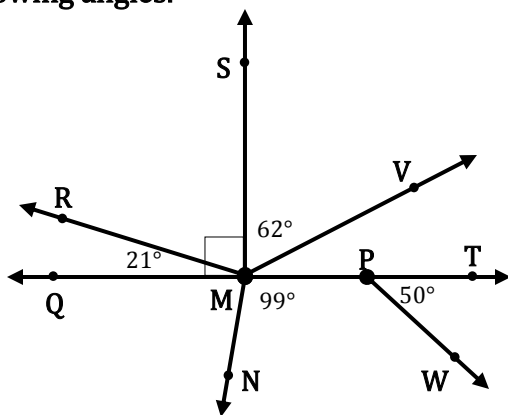
SET C

1) m∡ RMS = _____

2) m∡ VMT = _____

3) m∡ QMN = _____

4) m∡ WPQ = _____

The sum of angles located above $\overleftrightarrow{QT}$ =

SET D

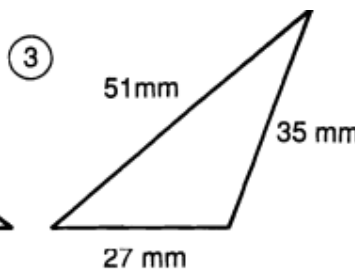5) m∡ AJK = _____

6) m∡ CKD = _____

7) m∡ FKH = _____

8) m∡ BLC = _____

The sum of angles located below $\overleftrightarrow{CG}$ =

Part 3: Classify each triangle two ways.

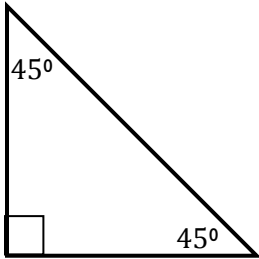① 9 cm   9 cm   8 cm

② 5 m   3 m   4 m

③ 51mm   35 mm   27 mm

④ 9.9 cm   7 cm   7 cm

⑤ 12 m   12 m   12 m

⑥ 8.3 km   5.1 km   5.1 km
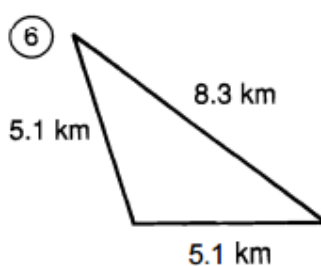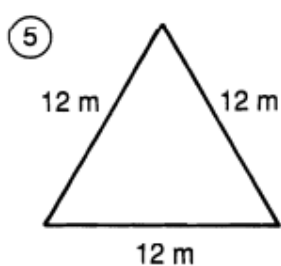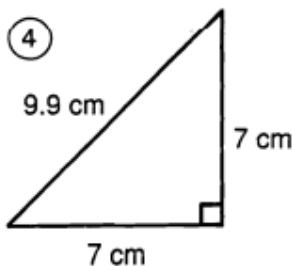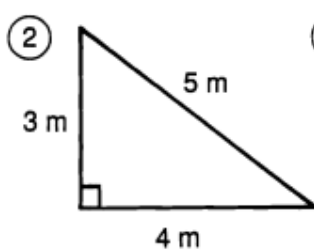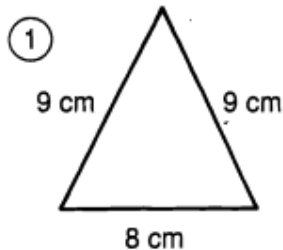
1) _____
_____

2) _____
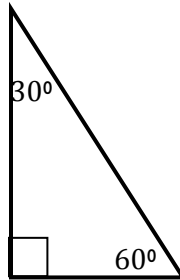_____

3) _____
_____

4) _____
_____

5) _____
_____

6) _____
_____

The Interior Angles of a Triangle

FACT: The three interior angles of a triangle always add up to _____°.
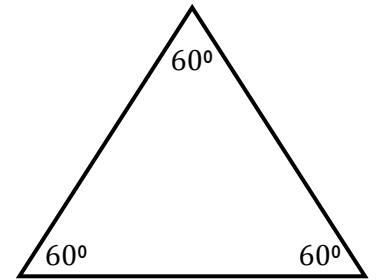
Example 1:

$45°$

$45°$

$30°$

$60°$

$60°$

$60°$

$60°$

$60°$

$45° + 45° +$ _____ $=$

$30° + 60° +$ _____ $=$

$60° + 60° + 60° =$ 3(_____) = _____

Example 2:   Find the missing angle in the triangle.

$20°$

x $125°$
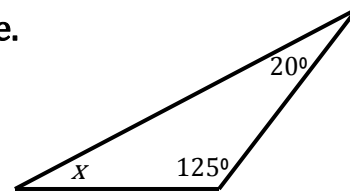
Solution:

Step 1: Write equation. $\underline{20°} + \underline{125°} +$ _____ $=$ _____

Step 2: Combine like terms.   _____ $+$ x $=$ $180°$

Step 3: Isolate x. $145° + x = 180°$

Step 4: State the solution. $x = $ _____

Step 5: Use solution to answer the original question.
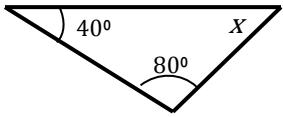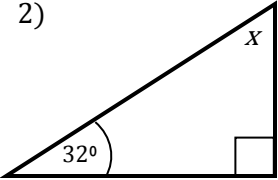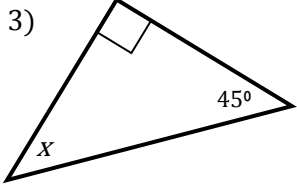
The measure of the missing angle is _____
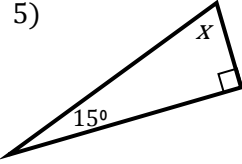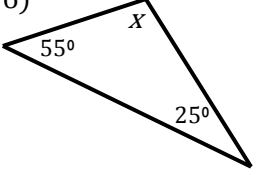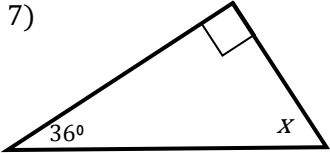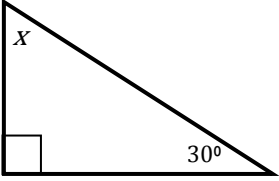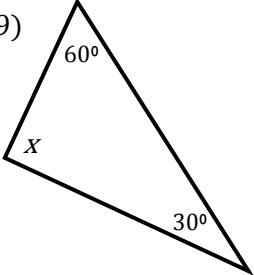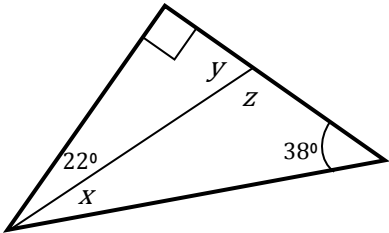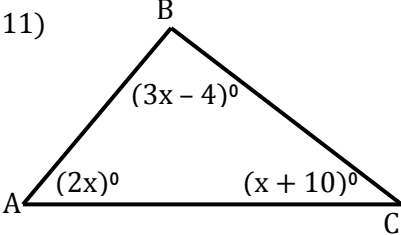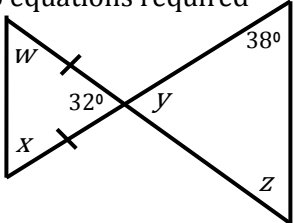
Example 3: Find the missing angle in the triangle.

$42°$

_____

_____

_____   **The measure of the missing angle is:**

_____   _____

_____

ASSIGNMENT
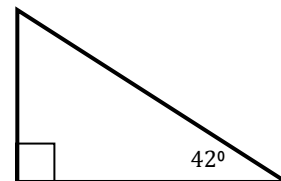
Independent Practice

Find the missing angle in the triangles.   For each problem, show an equation and solve.

1) 40^0 X 80^0	2) X 32^0	3) 45^0 X
4) 78^0 X	5) X 15^0	6) X 55^0 25^0
7) 36^0 X	8) X 30^0	9) 60^0 X 30^0

10) Two equations required

y
z
22^0 38^0
X

y: _____

z: _____

x: _____

11)

B

$(3x - 4)^0$

$(2x)^0$ $(x + 10)^0$
A   C

A: _____

B: _____

C: _____

12) Two equations required

W 38^0
32^0 y
X
z

w: _____

x: _____

y: _____

z: _____

The Exterior Angles of a Triangle

The exterior angle of a triangle is always equal to the sum of the opposite interior angles.

Example 1: Examine the figures below. Find the measure of the missing angle.

Figure A	Figure B
62^0 X 60^0 58^0	x z 40^0 50^0 y
1) Sum ∢'s in triangle = _____	1) ∢ x = _____
2) x = _____	2) ∢y = _____ ∢z = _____
3) Sum of interior angles opposite of angle "x"	3) Sum of interior angles opposite of angle "y" = _____
= _____ + _____ = _____	Sum of interior angles opposite of angle "z" = _____

Example 2: Find the measure of ∢x and ∢y.

Step 1: Use the rule for exterior angles to write an equation.

$$∢ A + ∢B = 120^0$$

B

x

75^0 y 120^0

A   C   D

$$x =$$
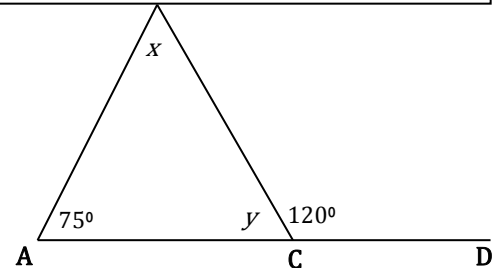
Step 2: The sum of the interior angles of a triangle always equals 180^0, and ∢BCA supplements ∢BCD, so either method below will result in the correct value of y!

Using SUM of INTERIOR ANGLES

$$75^0 + x + y = 180^0$$
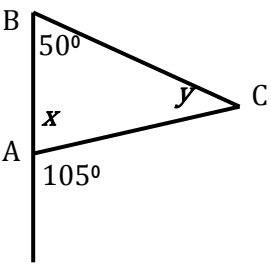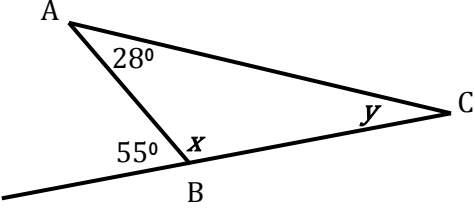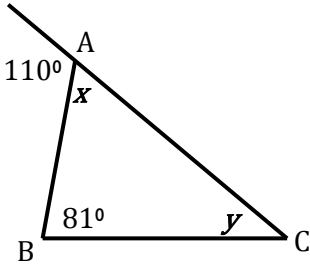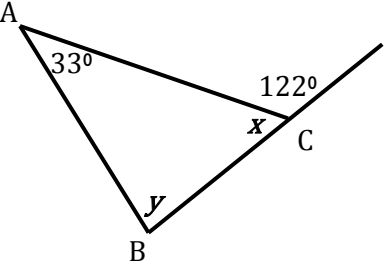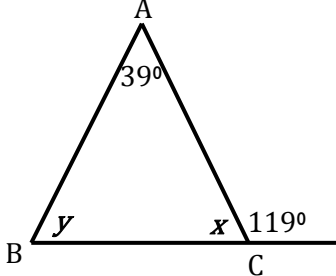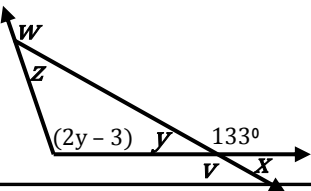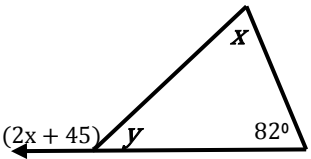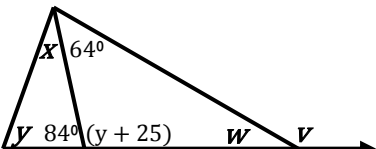
Using SUPPLEMENTAL ANGLES

$$∢ y + 120^0 = 180^0$$

$$y =$$ $$y =$$
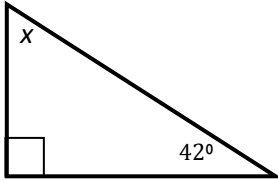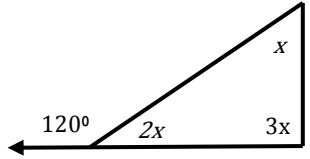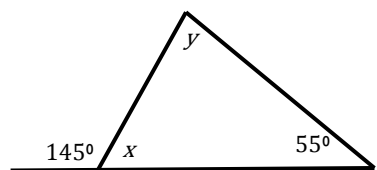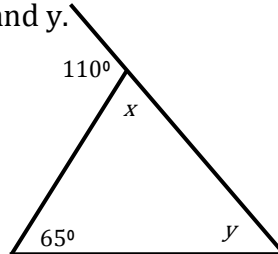
ASSIGNMENT

Independent Practice

Part 1: Find the measure of the missing angle measures.   Show an equation for each angle.
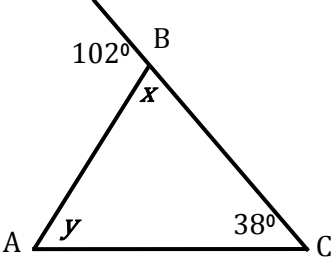
1)

102^0 B
x
y A 38^0 C

2)

B 50^0
x y C
A 105^0

3)

A
28^0
C
y
55^0 x
B

4)

A
110^0
x
81^0 y
B C

5)

A
33^0
122^0
x
C
y
B

6)

A
39^0
y x 119^0
B C

7)

w
z
$(2y - 3)$ y 133^0
v x

8)

x
$(2x + 45)$ y 82^0

9)

x 64^0
y 84^0 $(y + 25)$ w v

ASSIGNMENT

Follow-up, review assignment for homework after Pp 19 – 22

1) Find the missing angle. x 42^0	2) Solve for x. Then solve for each of the triangle's interior angles. x 120^0 $2x$ $3x$
3) Find the measures for x and y. y 145^0 x 55^0	4) Find the measures for x and y. 110^0 x 65^0 y
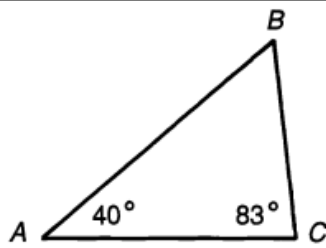
B
$40°$ $83°$
A C

5) $m\angle B =$

L
$29°$
$115°$
K J

6) $m\angle J =$

V
$72°$
W
U O X

7) $m\angle WOX =$

~~~~~~

P R
$67°$
T Q
S

8) $m\angle PQR =$

9) $m\angle PQT =$

B
C
$56°$
D
A

10) $m\angle DAB =$

11) $m\angle DAC =$

Y
$79°$ $138°$
X Z

12) $m\angle XZY =$

13) $m\angle Y =$

~~~~~~

M
L $37°$ N

14) $m\angle MNL =$

15) $m\angle M =$

E
$104°$
$41°$ D
F

16) $m\angle EFD =$

17) $m\angle E =$

B C
A D
$27°$ O $54°$
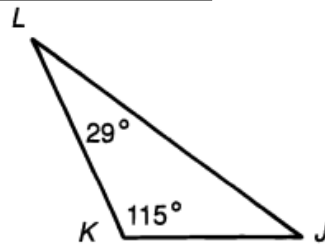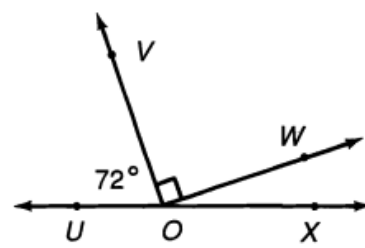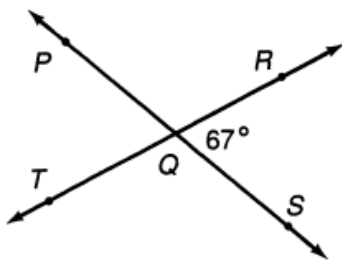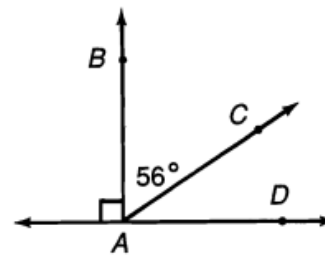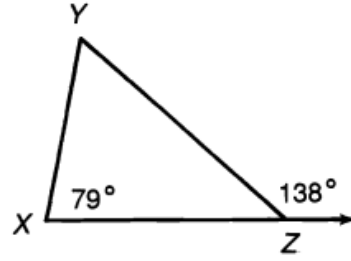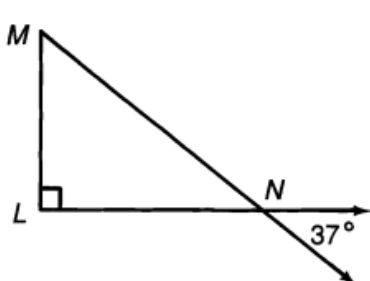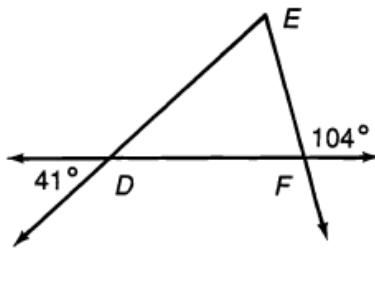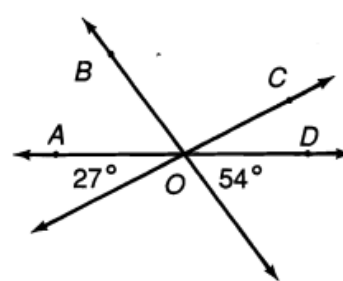
18) $m\angle AOB =$

19) $m\angle BOC =$

Corresponding Angles, Alternate Interior, and Alternate Exterior Angles

If two parallel lines are intersected by another line, how many angles are formed?

Number them on the diagram.

$\overline{PQ} \parallel \overline{RS}$
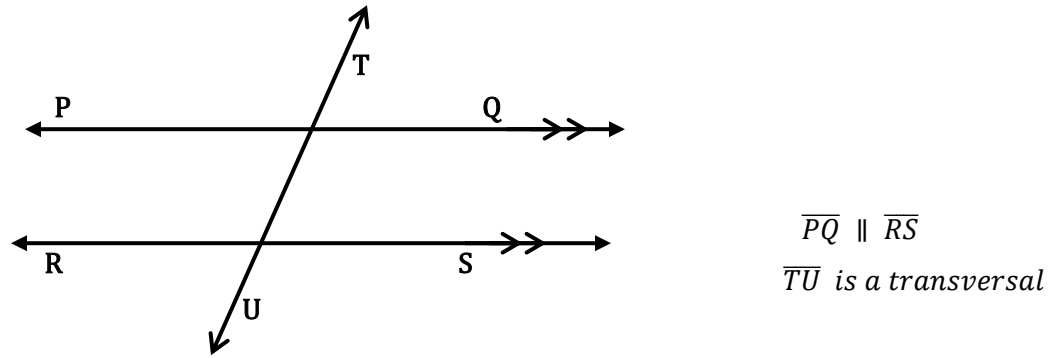
$\overline{TU}$ is a transversal

The extra arrows on two of the lines mean they are _____.

The line that intersects the two lines is called a _____.

The number of angles formed is _____.

The angles formed when parallel lines are cut by a transversal line have special relationships and are named according to those relationships with one another.

CORRESPONDING ANGLES

Definition:

Name the corresponding angles for the following.
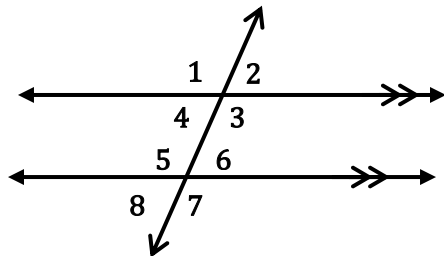
1) ∡1 corresponds with ∡_____

2) ∡2 corresponds with ∡_____

3) ∡3 corresponds with ∡_____

4) ∡4 corresponds with ∡_____

What do you notice about the angle pairs above?

Complete the sentence: If two angles are *corresponding*

angles, then they are: _____

ALTERNATE INTERIOR ANGLES

Definition:

Name the alternate interior angle for the following angles.

1) ∡3 is an alternate interior angle with ∡_____

2) ∡4 is an alternate interior angle with ∡_____

How many pairs of alternate interior angles are possible?

What do you notice about the angle pairs above?

Complete the sentence: If two angles are *alternate interior* angles, then they are: _____

Word attack
To **alternate** means:

INterior means:

ALTERNATE EXTERIOR ANGLES

Definition:

Name the alternate exterior angle for the following angles.

1) ∡1 is an alternate exterior angle with ∡_____

2) ∡2 is an alternate exterior angle with ∡_____

How many pairs of alternate exterior angles are possible?
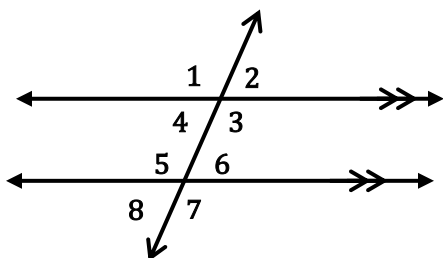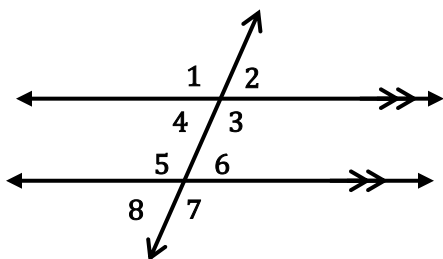
What do you notice about the angle pairs above?

Complete the sentence: If two angles are *alternate exterior* angles, then they are: _____

Word attack
To **alternate** means:

EXterior means:

PRACTICE: **Look at the diagram below.** For each pair of angles, state whether they are Corresponding (C), alternate Interior (I), alternate Exterior (E), Vertical (V), or Supplementary (S).

1) ∡u, ∡x _____

2) ∡w, ∡s _____

3) ∡t, ∡y _____

4) ∡s, ∡t _____

5) ∡w, ∡y _____

6) ∡t, ∡x _____

7) ∡w, ∡z _____

8) ∡v, ∡w _____

9) ∡v, ∡z _____

10) ∡s, ∡z _____

11) ∡t, ∡u _____

12) ∡w, ∡x _____

13) ∡w, ∡s _____

14) ∡s, ∡v _____

15) ∡x, ∡z _____

16) If m ∡s = 110⁰, find the measure of the remaining angles.

m∡v = _____   m∡t = _____   m∡u = _____   m∡w = _____ m∡x = _____   m∡y = _____   m∡z = _____

Parallel Lines Cut by a Transversal

As explained in the previous section, when two parallel lines are intersected, or "cut," by a transversal, eight angles are formed. Any two angles are either congruent or supplementary! Given the measure of just one of the eight angles, the other seven can be determined.

Example: Lines *a* and *b* are parallel. Line *m* intersects both line *a* and *b*. The eight resulting angles are labeled 1 – 8, and m∡1 is given to be 25⁰. Find all angle measures.
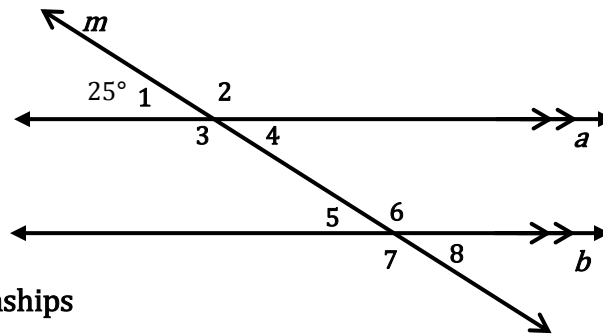
Step 1: Notice the relationships

∡1 and ∡4 are vertical angles and therefore ≅, so m∡4 = 25⁰.
Other pairs of vertical angles are ∡2 and ∡3, ∡5 and ∡8, ∡6 and ∡7.

∡1 is supplementary to ∡2; so the m∡2 = 180⁰ - ∡1 = 180 - 25⁰ = 155⁰.
∡1 is also supplementary to ∡3; so the m∡3 is also 155⁰.
Notice that ∡2 and ∡3are vertical angles, and would have to be ≅ to each other.

Step 2: Corresponding angles have the same relative position, like ∡1 and ∡5 are both in the upper left section of the intersecting lines. Corresponding angles are always congruent, so m∡1and m∡5are both 25⁰. ∡5 and ∡8 are vertical angles, so m∡8 = 25⁰.

∡6 and ∡8 form a linear pair, so m∡6 = 180° - 25° = 155°
∡6 and ∡7 are vertical angles, so m∡7 is also 155°.

Summary

m∡1, m∡4, m∡5 and m∡8 (all) = _____ and are _____ angles
                                                    measure   *type*

m∡2, m∡3, m∡6 and m∡7 (all) = _____ and are _____ angles
                                                    measure   *type*

ASSIGNMENT

INDEPENDENT PRACTICE

Part 1:

1) Parallel lines a and b when cut by transversal ℓ form eight angles, as shown in the diagram below. Use the diagram to find the measures of each of the angles.
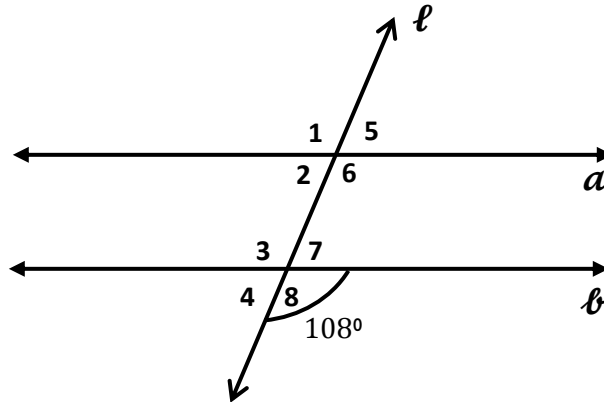
1) m∡1 = _____   3) m∡3 = _____   5) m∡5 = _____   7) m∡7 = _____

2) m∡2 = _____   4) m∡4 = _____   6) m∡6 = _____   8) m∡8 = __108⁰__
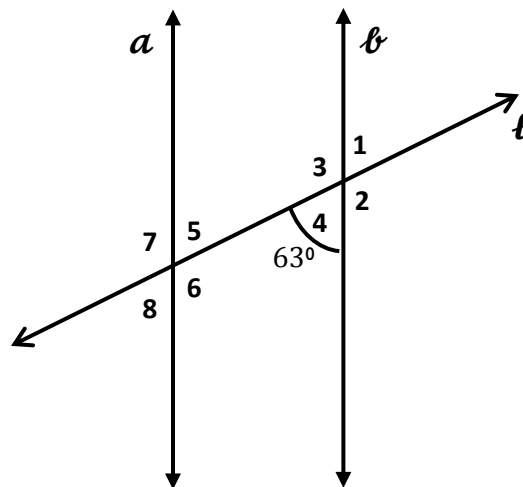
2) Parallel lines a and b when cut by transversal ℓ form eight angles, as shown in the diagram below. Use the diagram to find the measures of each of the angles.
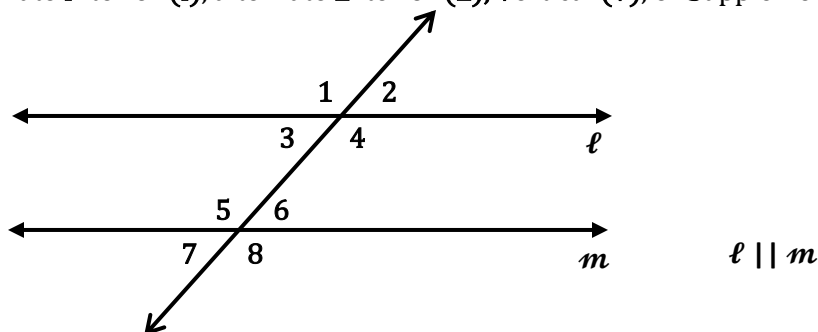

9) m∡1 = _____   11) m∡2 = _____   13) m∡3 = _____   15) m∡4 = __63⁰__

10) m∡5 = _____   12) m∡6 = _____   14) m∡7 = _____   16) m∡8 = _____

ASSIGNMENT

<u>Part 2:</u> For each pair of angles, state whether they are:
Corresponding (**C**), alternate Interior (**I**), alternate Exterior (**E**), Vertical (**V**), or Supplementary (**S**).

1) ∡1 and ∡4 _____

2) ∡2 and ∡6 _____

3) ∡1 and ∡3 _____

4) ∡5 and ∡8 _____

5) ∡5 and ∡7 _____

6) ∡6 and ∡5 _____

7) ∡2 and ∡7 _____

8) ∡1 and ∡2 _____

9) ∡4 and ∡5 _____

10) ∡6 and ∡8 _____

11) ∡3 and ∡6 _____

12) ∡4 and ∡8 _____

13) ∡1 and ∡5 _____

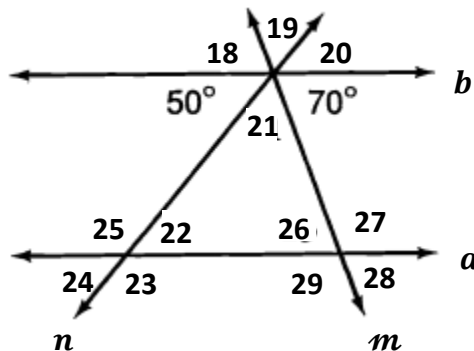14) ∡2 and ∡3 _____

15) ∡6 and ∡7 _____

Parallel lines a and b when cut by transversal m form eight angles, as shown in the diagram below. Use the diagram below for problems 16 and 17.

16) m ∡2 = _____

17) m ∡4 = _____
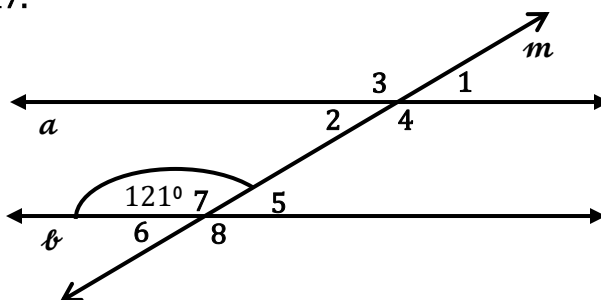
Parallel lines a and b when cut by transversals m and n. Find all of the unknown angle measures.

18) m ∡18 = _____   19) m ∡19 = _____

20) m ∡20 = _____   21) m ∡21 = _____

22) m ∡22 = _____   23) m ∡23 = _____

24) m ∡24 = _____   25) m ∡25 = _____

26) m ∡26 = _____   27) m ∡27 = _____

28) m ∡28 = _____   29) m ∡29 = _____

Finding Unknown Angle Measures

We will use the angle relationships that are formed when two parallel lines are intersected by a transversal to find the measures of missing angles.

**ALL** of the angle pair relationships will be either _____ or _____.

Example A: The pair of angles are either <u>vertical angles</u>, <u>alternate interior angles</u>, <u>alternate exterior angles</u>, or <u>corresponding angles</u>; so they are congruent. All you have to do is set up and solve an equation where the expressions are equal. Once you have solved for x, substitute that value back into each expression to find the measure of each angle asked for under the diagram.

#1
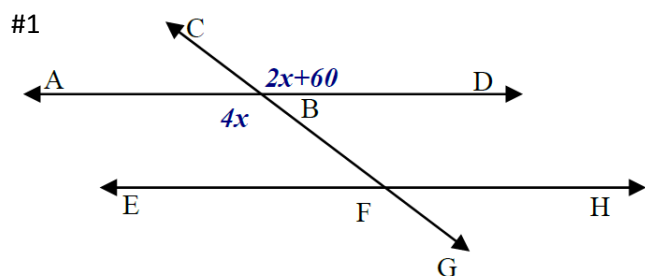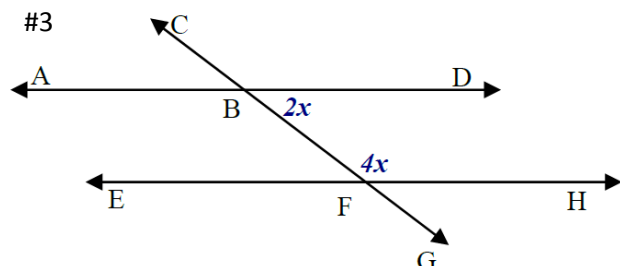
Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\sphericalangle ABG =$ _____ $\sphericalangle CBD =$ _____

#2
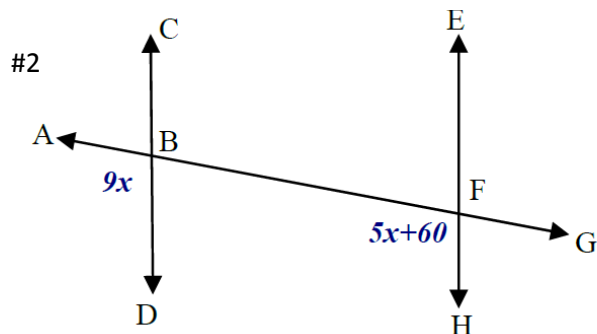
Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\sphericalangle ABD =$ _____ $\sphericalangle HFA =$ _____

Example B: Each pair of angles is supplementary, which means the two angles add up to 180°. All you have to do is set up and solve an equation where the expressions add up to equal 180°. Once you have solved for x, substitute that value back into each expression to find the measure of each angle asked for under the diagram.
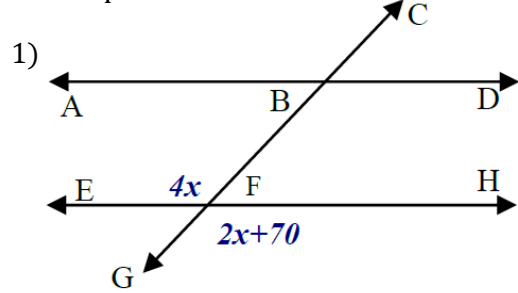
#3

Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\sphericalangle FBD =$ _____ $\sphericalangle HFB =$ _____
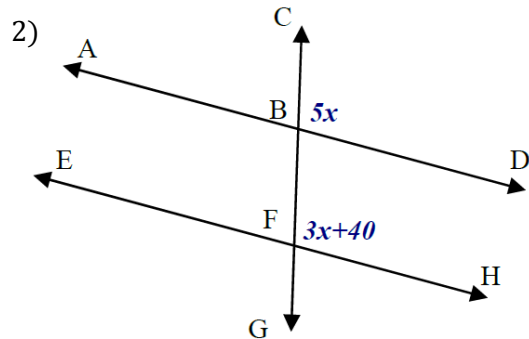
INDEPENDENT PRACTICE

Part 1: Find the measure of each missing angle in the parallel lines and transversal. Each pair of angles is either supplementary or congruent (<u>vertical angles</u>, <u>alternate interior angles</u>, <u>alternate exterior angles</u>, or <u>corresponding angles</u>). State the relationship (and whether supp or ≅), set up an appropriate equation and solve for x. Once you've solved for x, substitute that value back into each expression to find the measure of each angle asked for under the diagram.
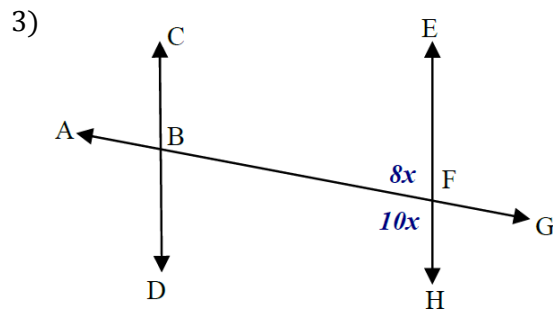
1)

Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\angle EFB =$ _____ $\angle GFH =$ _____

2)

Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\angle CBD =$ _____ $\angle BFH =$ _____

3)

Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\angle EFB =$ _____ $\angle BFH =$ _____

4)

Relationship: _____

Equation: _____

_____

_____

_____

_____

$x =$ _____ $\angle EFB =$ _____ $\angle DBF =$ _____

ASSIGNMENT

5)

$x =$ _____ ∡$CBA =$ _____ ∡$BFH =$ _____

Relationship: _____

Equation: _____

_____

_____

_____

_____

6)

$x =$ _____ ∡$CBA =$ _____ ∡$GFH =$ _____

Relationship: _____

Equation: _____

_____

_____

_____

_____

7)

$x =$ _____ ∡$DBA =$ _____ ∡$EFB =$ _____

Relationship: _____

Equation: _____

_____

_____

_____

_____

8)

$x =$ _____ ∡$CBA =$ _____ ∡$GFH =$ _____

Relationship: _____

Equation: _____
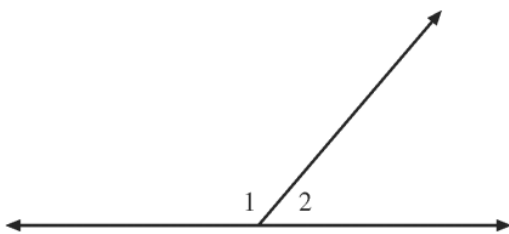
_____

_____

_____

_____

ASSIGNMENT

Part 2: The following problems are multiple choice. Circle the letter indicating the best answer for each question.

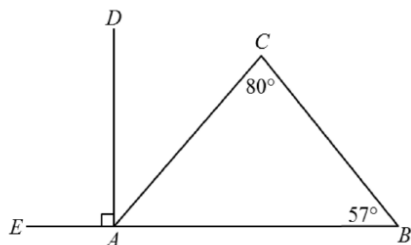**1)** Use the protractor below to find the measure of ∠ABC .
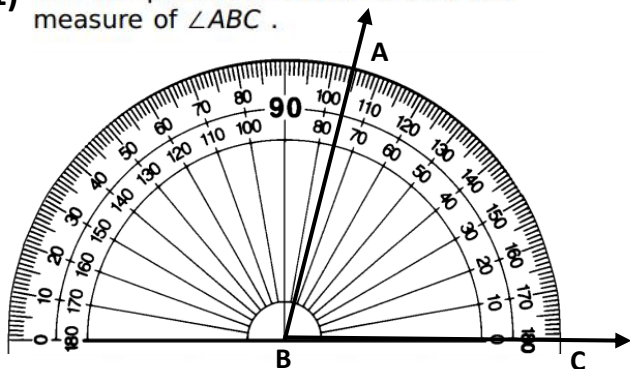
What appears to be the measure of angle ∠ABC?

A. 105°   B. 80°

C. 75°   D. 70°

2) What is the measure, in degrees, of the angle that is complementary to ∠RVS?

A. 30°   B. 60°

C. 90°   D. 110°

3) Which is a true statement about angles 1 and 2 shown below?
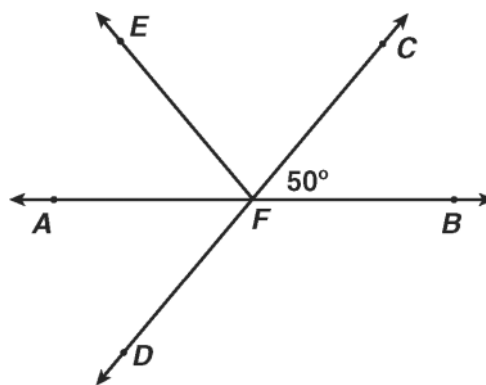

A. ∠1 is complementary to ∠2.

B. ∠1 is supplementary to ∠2.

C. Both angles are obtuse.

D. Both angles are acute.
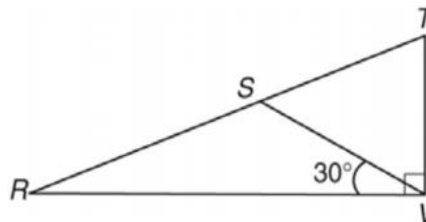
4) In the figure below, $\overleftrightarrow{CD}$ intersects $\overleftrightarrow{AB}$ at F, $m\angle CFB = 50°$, and $\angle EFA \cong \angle AFD$. What is $m\angle EFC$?
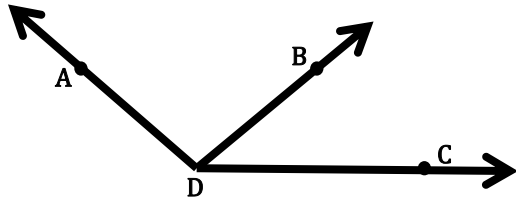

A. 40°   B. 50°   C. 70°   D. 80°

5) In the figure below, what is $m\angle DAC$?

A. 47°   B. 57°

C. 90°   D. 137°
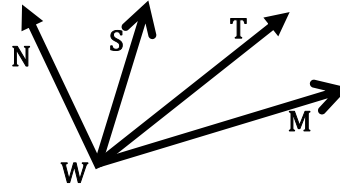
6)
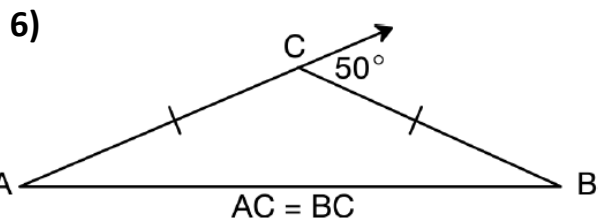
In △ABC, the measure of ∠A is

A. 25°.   B. 40°.   C. 45°.   D. 50°.

Review for Unit Test: 2-D Geometry

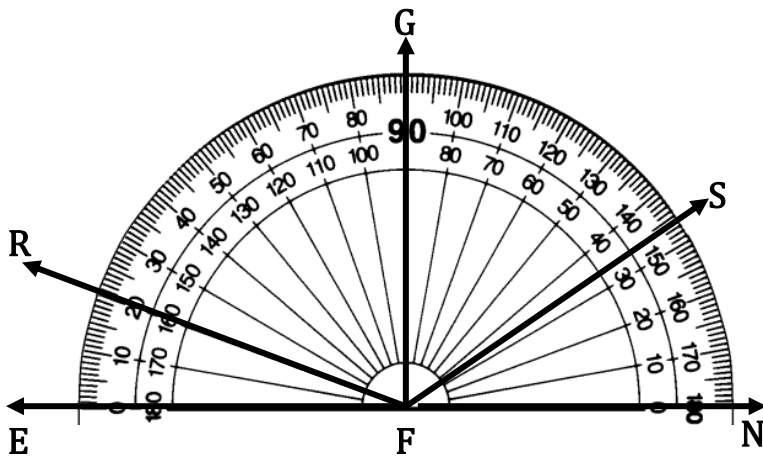Part 1: Key Terms, Types of Angles, Measuring Angles and Adjacent Angles

1) ∡CDB is adjacent

to ∡_____

2) ∡NWS is adjacent

to ∡_____

3) The vertex is:

_____

Use the protractor to measure each angle. Indicate whether it is acute, obtuse, right, or straight.

4) $m\angle EFG =$ _____; _____

5) $m\angle NFR =$ _____; _____

6) $m\angle EFS =$ _____; _____

7) $m\angle EFN =$ _____; _____

8) $m\angle SFN =$ _____; _____

The following questions are multiple choice. Circle the letter next to the best answer.

9) Which figure shows two lines that appear to be parallel?

A.

B.

C.

D.

10) Which of the following is a correct name for the angle indicated below with the question mark?
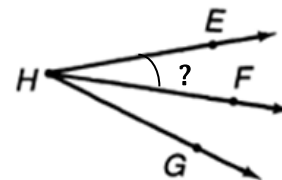
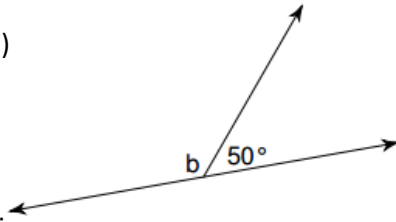A. ∠H

B. ∠FHE

C. ∠HEF

D. ∠GHE

Part 2: Vertical, Supplementary and Complementary Angles

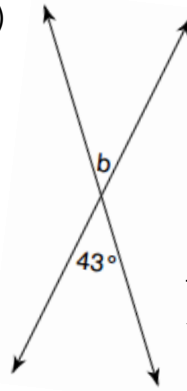Find the measure of angle b and classify the angle relationship.

1)

b / 50°
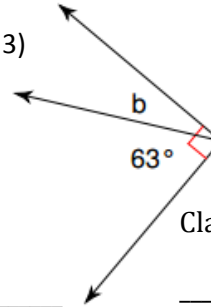
Classification:

_____

b: _____

2)

b

43°

Classification:
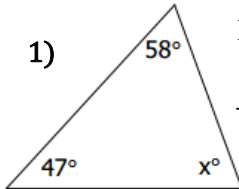
_____

b: _____

3)

b

63°

Classification:

_____

b: _____

Part 3: Interior and Exterior Angles of a Triangle

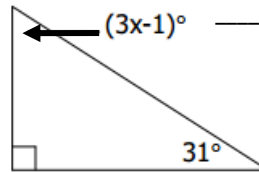Write a valid equation based on the diagrams below and then find the value of x in each problem.
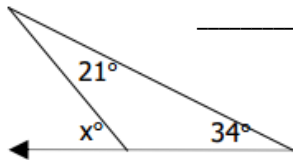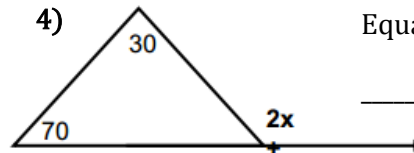
1)

58°

47°   x°

Equation:

_____

2)

(3x-1)°

31°

Equation:

_____

X: _____

X: _____

3)

21°

x°   34°

Equation:

_____

X: _____

4)
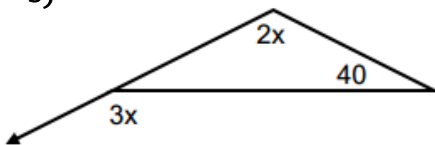
30

70   2x

Equation:

_____

X: _____

5)

2x

40

3x

Equation: _____

X: _____

ASSIGNMENT
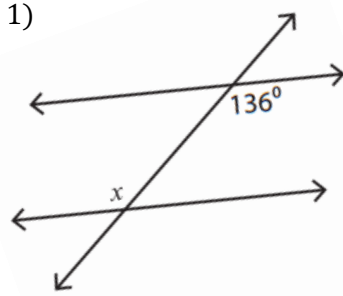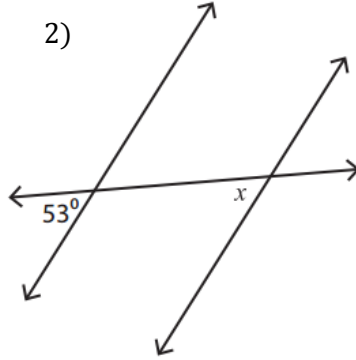
<u>Part 4:</u> Parallel Lines and Transversals

For each pair of angles, state whether they are:
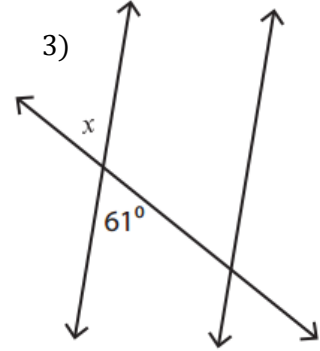Corresponding **(C)**, alternate Interior **(I)**, alternate Exterior **(E)**, Vertical **(V)**, or Supplementary **(S)**.

1)

136^0

x

X: _____

Relationship: _____

2)

53^0

x

X: _____

Relationship: _____

3)

x

61^0

X: _____

Relationship: _____

4)

125^0

x

X: _____

Relationship: _____

5)

88^0

x

X: _____

Relationship: _____

6)

110^0

x
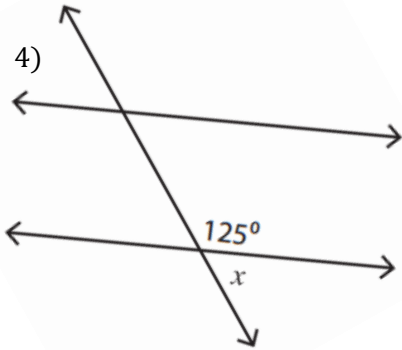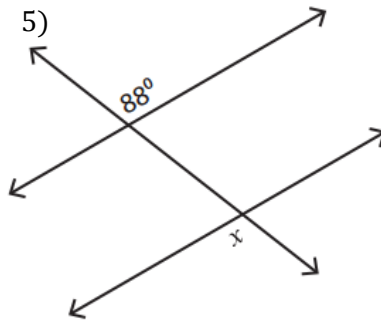
X: _____

Relationship: _____

<u>Part 5:</u> EQUATIONS
(Step 1) Identify the relationship for the angle pairs: **c**orresponding (C), alternate **i**nterior (I), alternate **e**xterior (E), **v**ertical (V), or **s**upplementary (S). **(Step 2)** Write an equation based on the relationship (supplementary or congruent), and **(Step 3)** Solve for x.

7)   Relationship: _____

78^0

$(x+28)^0$

Equation: _____

8)   Relationship: _____

$(7x-12)^0$

114^0

Equation: _____

X: _____   X: _____

ASSIGNMENT

Identify the relationship of the angles. corresponding (C), alternate interior (I), alternate exterior (E), vertical (V), or supplementary (S) angles. Write an equation and solve for x.
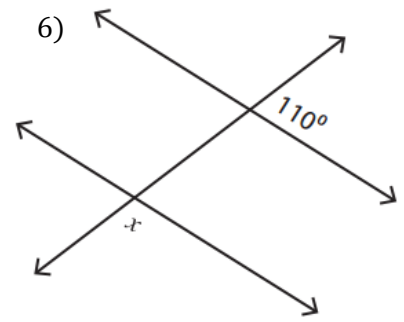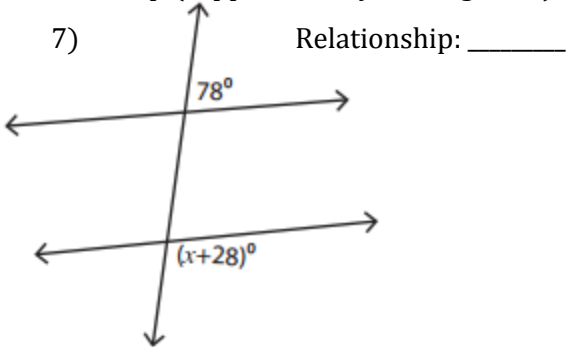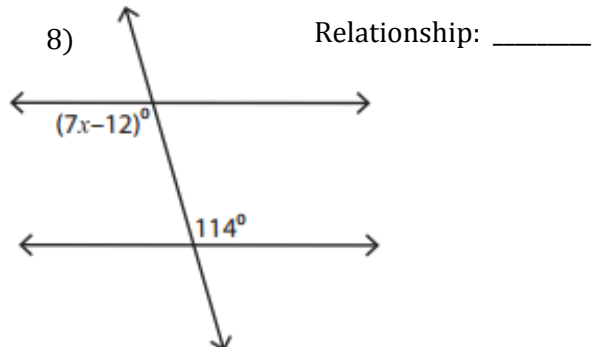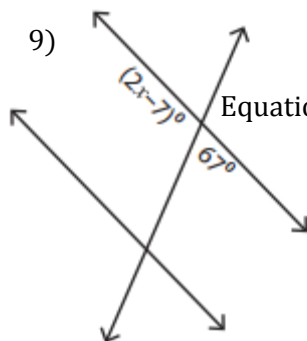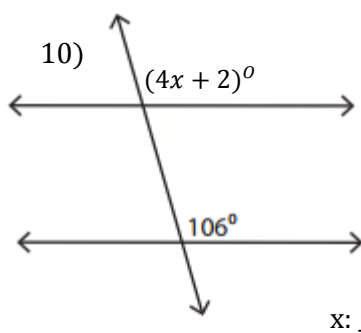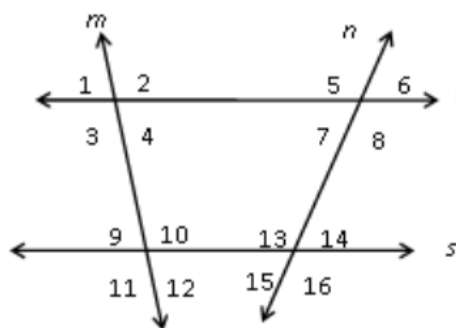
9)

$(2x-7)°$

$67°$

Relationship: _____

Equation _____

X: _____

10)

$(4x + 2)°$

$106°$

Relationship: _____

Equation _____

X: _____

11) Find the measure of each angle indicated below, **given m ∡2 = 97° and m ∡6 = 83°.**

m∠ 3 = _____   m∠ 5 = _____

m∠10 = _____   m∠ 7 = _____

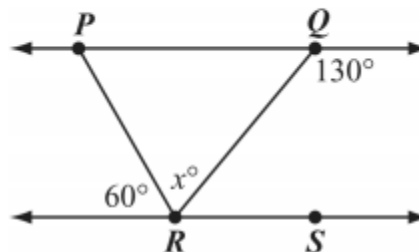m∠ 9 = _____   m∠16 = _____

Part 6: The following questions are multiple choice. Circle the letter next to the best answer.

12) In the drawing, what is the measure of angle y?

$40°$

x y

$60°$
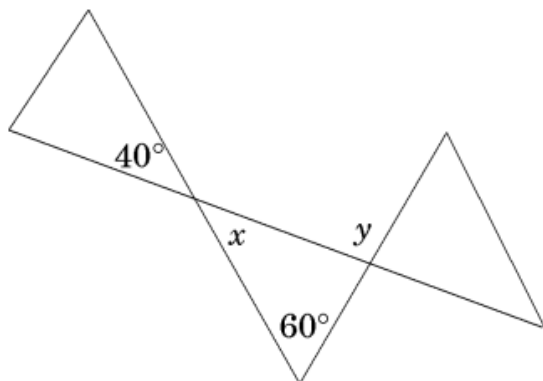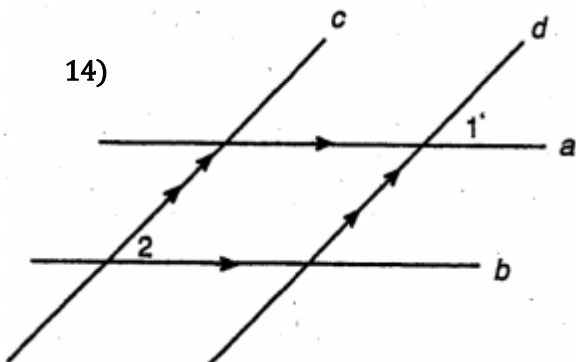
A. 40   B. 60   C. 80   D. 100

13) In the diagram below, $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ are parallel.

$130°$

$60°$ $x°$

R   S

Based on the angle measures in the diagram, what is the value of x?

A. 70   B. 60   C. 50   D. 40

14)

c   d

1

a

2

b

Given: $a \parallel b$, $c \parallel d$

If $m\angle 1 = 2x + 16$ and $m\angle 2 = x + 14$, then what is the value of x?

A. −10   B. −2   C. 2   D. 10