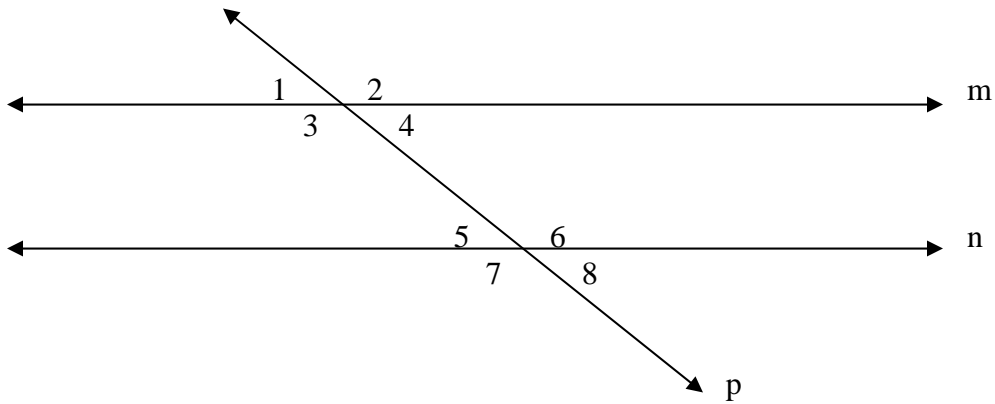


Aim: What are the angle relationships formed when 2 parallel lines are cut by a transversal?

Warm – up

Words to know:

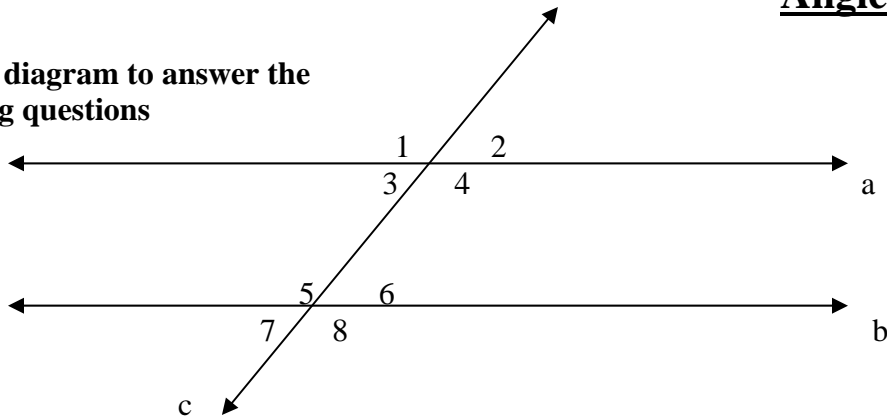
Parallel Lines	
Perpendicular Lines	
Transversal	



Angle Relationship Formed	Examples
Supplementary Angles	
Vertical Angles	
Corresponding Angles	
Alternate Interior Angles	
Alternate Exterior Angles	
Interior angles on the same side of the Transversal	

Angle Relationship Classwork

Use this diagram to answer the following questions



Tell what type of angle each pair is:
(supplementary, vertical, corresponding, alternate interior, alternate exterior angles)

1. $\angle 1$ and $\angle 5$ _____
2. $\angle 2$ and $\angle 7$ _____
3. $\angle 5$ and $\angle 6$ _____
4. $\angle 5$ and $\angle 8$ _____
5. $\angle 3$ and $\angle 6$ _____
6. $\angle 1$ and $\angle 4$ _____
7. $\angle 2$ and $\angle 3$ _____
8. $\angle 5$ and $\angle 3$ _____
9. $\angle 1$ and $\angle 8$ _____

10. True or False: Angles 4 and 5 are congruent.

11. True or False: Angles 3 and 6 are congruent.

12. Name the parallel lines: _____

13. Name the transversal: _____

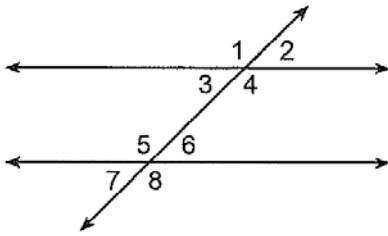
14. Define Complementary Angles _____

15. Define Supplementary Angles _____

Name: _____

Questions 1 through 6 refer to the following:

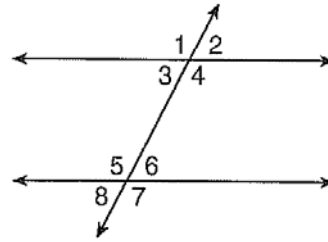
In the diagram below, two parallel lines are cut by a transversal. Based on this diagram, identify the angle relationship for the given angle pair.



- 1) $\sphericalangle 3$ and $\sphericalangle 6$
 - A) vertical angles
 - B) alternate exterior angles
 - C) alternate interior angles
 - D) corresponding angles
- 2) $\sphericalangle 1$ and $\sphericalangle 4$
 - A) corresponding angles
 - B) alternate interior angles
 - C) vertical angles
 - D) supplementary angles
- 3) $\sphericalangle 3$ and $\sphericalangle 7$
 - A) interior angles on the same side of the transversal
 - B) alternate interior angles
 - C) corresponding angles
 - D) alternate exterior angles
- 4) $\sphericalangle 2$ and $\sphericalangle 7$
 - A) vertical angles
 - B) alternate exterior angles
 - C) supplementary angles
 - D) alternate interior angles
- 5) $\sphericalangle 4$ and $\sphericalangle 6$
 - A) alternate interior angles
 - B) interior angles on the same side of the transversal
 - C) vertical angles
 - D) corresponding angles
- 6) $\sphericalangle 3$ and $\sphericalangle 5$
 - A) alternate exterior angles
 - B) supplementary angles
 - C) corresponding angles
 - D) alternate interior angles

Questions 7 through 9 refer to the following:

In the diagram below, two parallel lines are cut by a transversal and eight angles are formed.



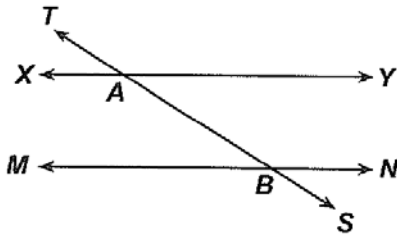
- 7) In the diagram shown, what is one pair of alternate interior angles?

A) $\sphericalangle 4$ and $\sphericalangle 5$	C) $\sphericalangle 1$ and $\sphericalangle 2$
B) $\sphericalangle 6$ and $\sphericalangle 8$	D) $\sphericalangle 4$ and $\sphericalangle 6$
- 8) In the diagram shown, what is one pair of interior angles on the same side of the transversal?

A) $\sphericalangle 6$ and $\sphericalangle 8$	C) $\sphericalangle 4$ and $\sphericalangle 6$
B) $\sphericalangle 4$ and $\sphericalangle 5$	D) $\sphericalangle 2$ and $\sphericalangle 7$
- 9) In the diagram shown, what is one pair of corresponding angles?

A) $\sphericalangle 4$ and $\sphericalangle 6$	C) $\sphericalangle 2$ and $\sphericalangle 8$
B) $\sphericalangle 1$ and $\sphericalangle 5$	D) $\sphericalangle 4$ and $\sphericalangle 5$

- 10) In the diagram below, lines \overline{XY} and \overline{MN} are parallel. Line \overline{ST} intersects line \overline{XY} at point A and intersects line \overline{MN} at point B .

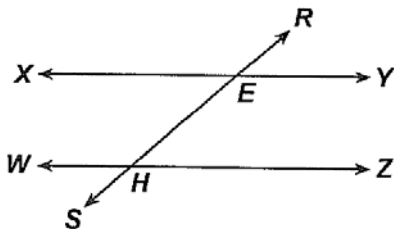


Angle YAB and angle MBA in the given diagram must be congruent. Why?

- A) The angles are vertical angles.
- B) The angles are corresponding angles.
- C) The angles are alternate exterior angles.
- D) The angles are alternate interior angles.

Questions 11 and 12 refer to the following:

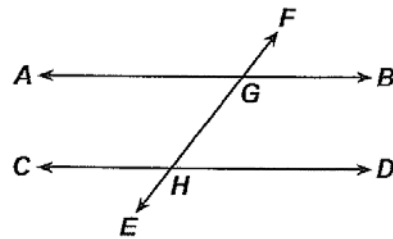
In the diagram below, transversal \overline{RS} intersects parallel lines \overline{XY} and \overline{WZ} at E and H , respectively.



- 11) What are a pair of alternate interior angles in the diagram shown?
- A) $\sphericalangle XEH$ and $\sphericalangle ZHE$
 - B) $\sphericalangle XER$ and $\sphericalangle ZHE$
 - C) $\sphericalangle YEH$ and $\sphericalangle ZHE$
 - D) $\sphericalangle WHE$ and $\sphericalangle ZHE$
- 12) What are a pair of alternate exterior angles in the diagram shown?
- A) $\sphericalangle XER$ and $\sphericalangle ZHS$
 - B) $\sphericalangle ZHE$ and $\sphericalangle ZHS$
 - C) $\sphericalangle YER$ and $\sphericalangle ZHS$
 - D) $\sphericalangle WHS$ and $\sphericalangle ZHS$

Questions 13 through 16 refer to the following:

In the diagram below, line \overline{AB} and line \overline{CD} are parallel. Line \overline{EF} intersects line \overline{AB} at point G and intersects line \overline{CD} at point H .

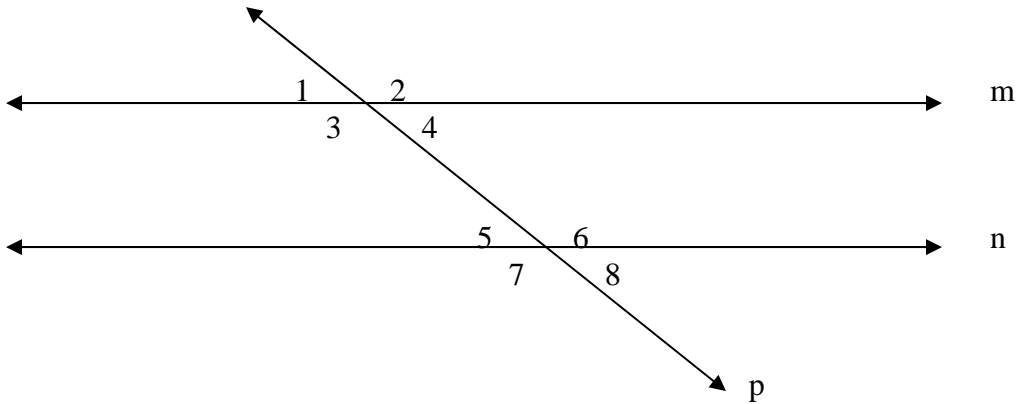


- 13) Why must angle AGH be congruent to angle DHG in the diagram shown?
- A) The angles are vertical angles.
 - B) The angles are corresponding angles.
 - C) The angles are alternate exterior angles.
 - D) The angles are alternate interior angles.
- 14) Why must angle FGB be congruent to angle CHE in the diagram shown?
- A) The angles are vertical angles.
 - B) The angles are corresponding angles.
 - C) The angles are alternate exterior angles.
 - D) The angles are alternate interior angles.
- 15) Why must angle CHG be congruent to angle DHE in the diagram shown?
- A) The angles are corresponding angles.
 - B) The angles are alternate interior angles.
 - C) The angles are alternate exterior angles.
 - D) The angles are vertical angles.
- 16) Why must angle DHG be congruent to angle BGF in the diagram shown?
- A) The angles are alternate interior angles.
 - B) The angles are alternate exterior angles.
 - C) The angles are corresponding angles.
 - D) The angles are vertical angles.

Aim: How do we find a missing angle when 2 parallel lines are cut by a transversal?

Warm Up: Quiz

Use the following diagram to answer questions # 1 - 12



1. Give the measure of each angle if $m\angle 1 = 105^\circ$

$\angle 2 = \underline{\hspace{2cm}}$ $\angle 3 = \underline{\hspace{2cm}}$ $\angle 4 = \underline{\hspace{2cm}}$ $\angle 5 = \underline{\hspace{2cm}}$ $\angle 6 = \underline{\hspace{2cm}}$ $\angle 7 = \underline{\hspace{2cm}}$ $\angle 8 = \underline{\hspace{2cm}}$

2. Give the measure of each angle if $m\angle 3 = 80^\circ$

$\angle 1 = \underline{\hspace{2cm}}$ $\angle 2 = \underline{\hspace{2cm}}$ $\angle 4 = \underline{\hspace{2cm}}$ $\angle 5 = \underline{\hspace{2cm}}$ $\angle 6 = \underline{\hspace{2cm}}$ $\angle 7 = \underline{\hspace{2cm}}$ $\angle 8 = \underline{\hspace{2cm}}$

3. Give the measure of each angle if $m\angle 8 = 150^\circ$

$\angle 1 = \underline{\hspace{2cm}}$ $\angle 2 = \underline{\hspace{2cm}}$ $\angle 3 = \underline{\hspace{2cm}}$ $\angle 4 = \underline{\hspace{2cm}}$ $\angle 5 = \underline{\hspace{2cm}}$ $\angle 6 = \underline{\hspace{2cm}}$ $\angle 7 = \underline{\hspace{2cm}}$

4. Give the measure of each angle if $m\angle 6 = 75^\circ$

$\angle 1 = \underline{\hspace{2cm}}$ $\angle 2 = \underline{\hspace{2cm}}$ $\angle 3 = \underline{\hspace{2cm}}$ $\angle 4 = \underline{\hspace{2cm}}$ $\angle 5 = \underline{\hspace{2cm}}$ $\angle 7 = \underline{\hspace{2cm}}$ $\angle 8 = \underline{\hspace{2cm}}$

5. If $m\angle 4 = 95^\circ$, find $m\angle 6$ $\underline{\hspace{2cm}}$

9. If $m\angle 5 = 117^\circ$, find $m\angle 8$ $\underline{\hspace{2cm}}$

6. If $m\angle 3 = 120^\circ$, find $m\angle 6$ $\underline{\hspace{2cm}}$

10. If $m\angle 5 = 122^\circ$, find $m\angle 7$ $\underline{\hspace{2cm}}$

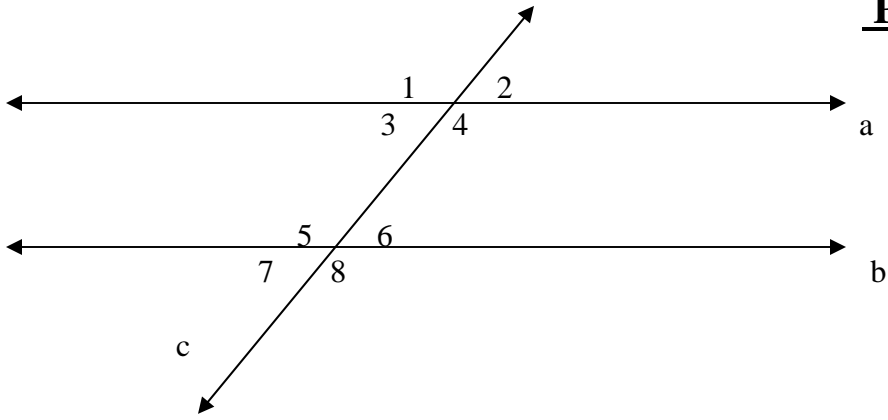
7. If $m\angle 8 = 132^\circ$, find $m\angle 1$ $\underline{\hspace{2cm}}$

11. If $m\angle 2 = 73^\circ$, find $m\angle 3$ $\underline{\hspace{2cm}}$

8. If $m\angle 1 = 112^\circ$, find $m\angle 5$ $\underline{\hspace{2cm}}$

12. If $m\angle 6 = 82^\circ$, find $m\angle 7$ $\underline{\hspace{2cm}}$

Parallel Lines Classwork



1. Give the measure of each angle if $m\angle 1 = 115^\circ$

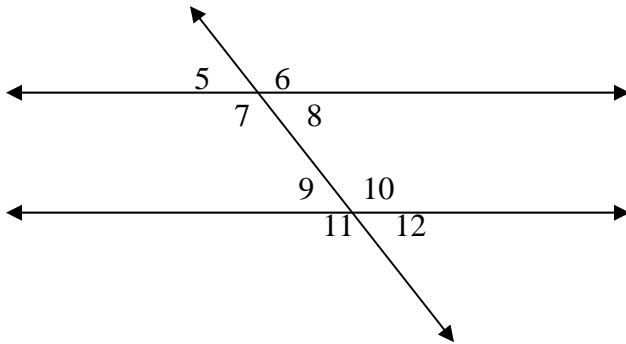
$\angle 2 =$ _____ $\angle 3 =$ _____ $\angle 4 =$ _____ $\angle 5 =$ _____ $\angle 6 =$ _____ $\angle 7 =$ _____ $\angle 8 =$ _____

2. If $m\angle 4 = 100$, find the $m\angle 1$ _____

4. If $m\angle 1 = 109$, find the $m\angle 5$ _____

3. If $m\angle 3 = 120$, find the $m\angle 6$ _____

5. If $m\angle 2 = 42$, find the $m\angle 7$ _____



6. Give the measure of each angle if $m\angle 7 = 58^\circ$

$\angle 5 =$ _____ $\angle 6 =$ _____ $\angle 8 =$ _____ $\angle 9 =$ _____ $\angle 10 =$ _____ $\angle 11 =$ _____ $\angle 12 =$ _____

7. If $m\angle 5 = 98^\circ$, find $m\angle 12$ _____

8. If $m\angle 9 = 105^\circ$, find $m\angle 12$ _____

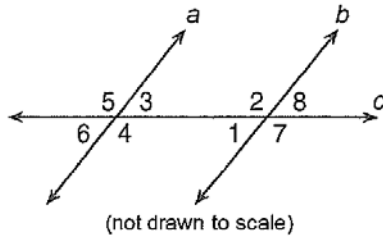
9. If $m\angle 7 = 72^\circ$, find $m\angle 10$ _____

10. If $m\angle 5 = 42^\circ$, find $m\angle 6$ _____

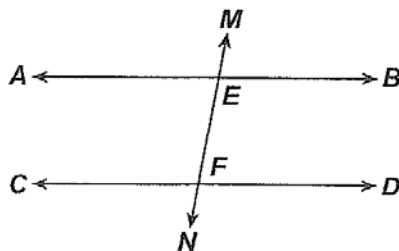
Name: _____

Questions 1 through 6 refer to the following:

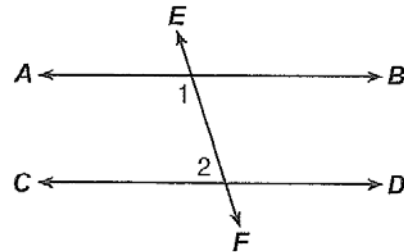
Given the figure below where $a \parallel b$.



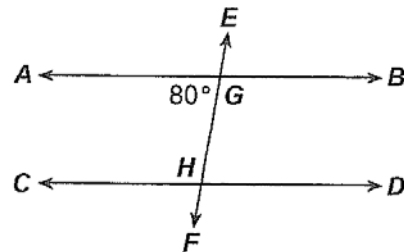
- 1) Find the $m\angle 5$ if $m\angle 7 = 123$
- 2) Find the $m\angle 4$ if $m\angle 2 = 145$
- 3) Find the $m\angle 1$ if $m\angle 6 = 36$
- 4) Find the $m\angle 2$ if $m\angle 3 = 72$
- 5) Find the $m\angle 7$ if $m\angle 8 = 52$
- 6) Find the $m\angle 1$ if $m\angle 5 = 127$
- 7) In the accompanying diagram, transversal \overline{MN} intersects parallel lines \overline{AB} and \overline{CD} at E and F , respectively. If $m\angle AEF$ is 80° , find the number of degrees in $\angle EFD$.



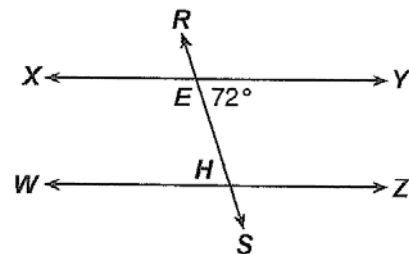
- 8) In the accompanying diagram, parallel lines \overline{AB} and \overline{CD} are cut by transversal \overline{EF} . If $m\angle 2 = 68^\circ$, what is $m\angle 1$? [Show all your work.]



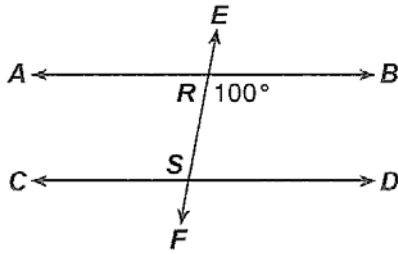
- 9) In the accompanying diagram, \overline{AB} and \overline{CD} are parallel and \overline{EF} intersects \overline{AB} at G and \overline{CD} at H . If $m\angle AGH = 80^\circ$, what is $m\angle CHG$? [Show all your work.]



- 10) In the accompanying diagram, transversal \overline{RS} intersects parallel lines \overline{XY} and \overline{WZ} at E and H , respectively. If $m\angle HEY = 72^\circ$, what is $m\angle ZHE$? [Show all your work.]

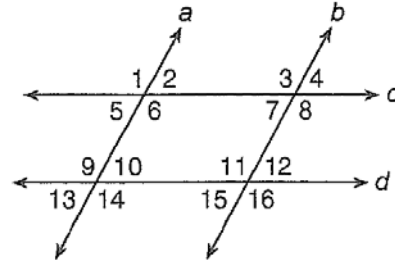


- 11) In the accompanying diagram, parallel lines \overline{AB} and \overline{CD} are intersected by transversal \overline{EF} at R and S , respectively. If $m\angle BRS = 100^\circ$, find $m\angle RSD$.
 [Show all your work.]



Questions 12 through 14 refer to the following:

In the diagram below, $a \parallel b$, $c \parallel d$, and $m\angle 8 = 48$

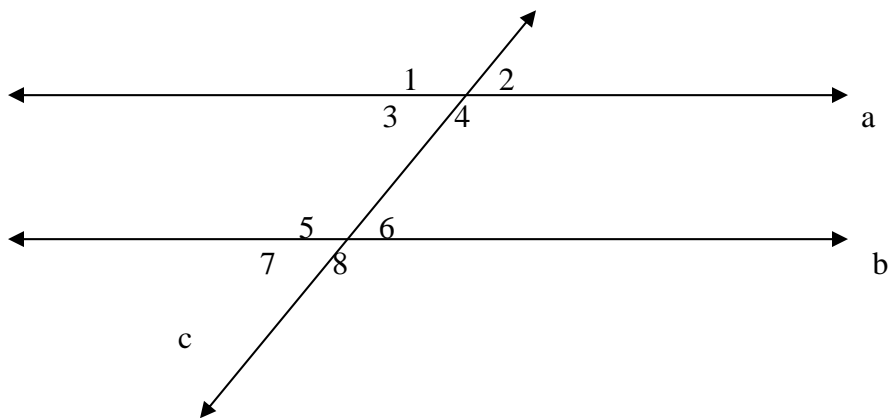


- 12) What is the $m\angle 3$ in the given diagram?
- 13) What is the $m\angle 1$ in the given diagram?
- 14) What is the $m\angle 4$ in the given diagram?

Aim: How do we find a missing angle algebraically?

Warm Up:

Use the diagram below to answer questions #1-6



Solve Algebraically!

1. If $m\angle 4 = 5x + 10$ and $m\angle 8 = x + 30$, solve for x

2. If $m\angle 3:m\angle 4 = 4:5$, solve for x

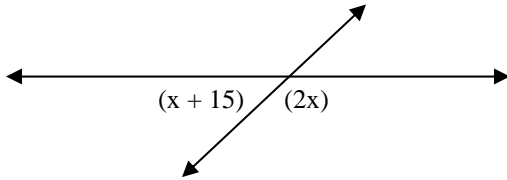
3. If $m\angle 1 = 3x + 20$ and $m\angle 2 = x + 40$, find $m\angle 2$

4. If $m\angle 4:m\angle 2 = 7:3$, find $m\angle 2$

5. If $m\angle 6 = 5x - 10$ and $m\angle 7 = 2x + 20$, find $m\angle 5$

6. If $m\angle 2 = 5x + 10$ and $m\angle 6 = 2x + 40$, find $m\angle 7$

7.

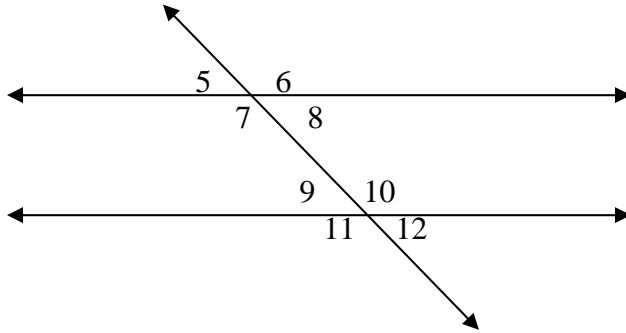


Which equation can be used to find the value of x ?

a) $2x = x + 15$ b) $2x + x + 15 = 90$

c) $2x + x + 15 = 180$ d) $2x(x + 15) = 0$

Use the diagram below for #8-12



8. If $m\angle 5 = 3x - 10$ and $m\angle 8 = x + 80$, solve for x .

9. If $m\angle 7 = 5x + 12$ and $m\angle 11 = 2x + 51$, find the measure of $\angle 7$.

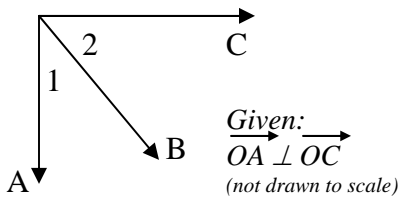
10. If $m\angle 9 = 3x - 10$ and $m\angle 10 = 2x + 40$, find the measure of $\angle 9$.

11. True or False: Angles 7 and 10 are congruent.

12. True or False: Angles 11 and 12 are congruent.

Name _____

8R - Chapter 7/8
Angles & Parallel lines

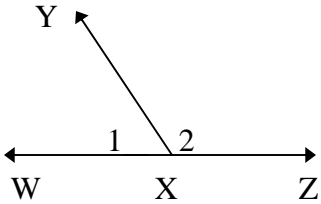


1) $m\angle BOC = 46^\circ$
find $m\angle BOA$

2) $\angle 1 = 3x + 5$
 $\angle 2 = 2x - 15$
find $m\angle 1$

3) What is the complement of a 42° angle? _____

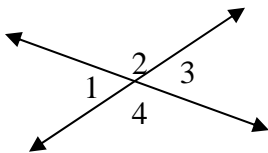
4) What does it mean when angles are complementary?



5) $m\angle 1 = 62^\circ$
find $m\angle 2$

6) $m\angle 2 = 4x + 2$
 $m\angle 1 = x + 8$
Solve for x.

7) How are supplementary angles and complementary angles different?



8) Name the vertical angle pairs.

9) $m\angle 4 = 125^\circ$
Find $m\angle 2$ ____
Find $m\angle 1$ ____

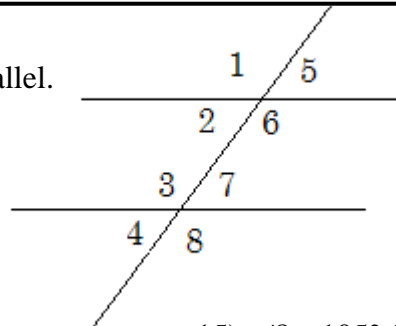
10) $\angle 3 = 6x - 12$
 $\angle 1 = 3x + 21$
Find $m\angle 1$

11. What is the complement of 58?

12. What is the supplement of 36?

13. What is the complement of $7x$?

The following two lines are parallel.
Use the diagrams to answer
the following questions.



14) $\angle 2 = 70^\circ$, find $\angle 7$ _____

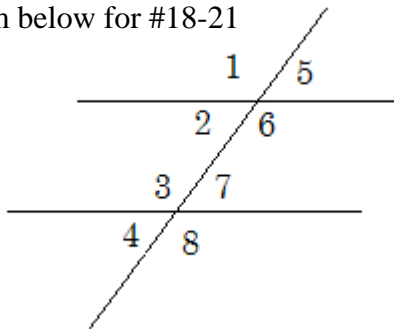
15) $\angle 8 = 105^\circ$ find $\angle 3$ _____

16) $\angle 6 = 145^\circ$, find $\angle 7$ _____

Name the relationship _____

17) Name all the angles that are supplementary to $\angle 2$. _____

Use the diagram below for #18-21



$\angle 4 = 5x$

$\angle 7 = 2x + 40$

$\angle 1 = 4x - 10$

18) $\angle 7 = 3x + 10$

19) $\angle 5 = 3x + 20$

20) $\angle 8 = x + 80$

Solve for x.

Find $m\angle 3$.

Find $m\angle 7$

21) $m\angle 5 = 2x$ and $m\angle 6 = 3x$ What equation would you write in order to solve the problem? Explain why.