

## Bell Ringer

Thursday 12/19

Find the distance between the two points.

Identify as concave or convex.

Solve for x.

$x_1, y_1$   $x_2, y_2$   
 $L(7, -1)$  and  $M(-2, 4)$

$$d = \sqrt{(-2 - 7)^2 + (4 - (-1))^2}$$

$$= \sqrt{(-9)^2 + (5)^2}$$

$$= \sqrt{81 + 25}$$

$$= \sqrt{106}$$

$$\approx 10.3$$

∠  
 vertex

∠  
 concave

$$\frac{x+1}{2} = (4x-3)\sqrt{2}$$

$$x+1 = 8x-6$$

$$x = 8x - 7$$

$$-8x - 8x$$

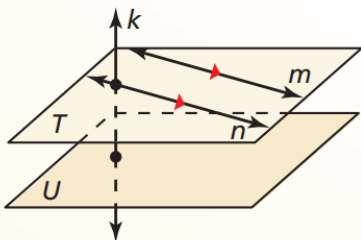
$$\frac{-7x = -7}{-7} \quad \frac{-7}{-7}$$

$$x = 1$$

Update Bell Ringer Score on packet

### Parallel Lines, Skew Lines, and Parallel Planes

Two lines that do not intersect are either *parallel lines* or *skew lines*. Recall that two lines are parallel lines when they do not intersect and are coplanar. Two lines are **skew lines** when they do not intersect and are not coplanar. Also, two planes that do not intersect are **parallel planes**.



Lines  $m$  and  $n$  are parallel lines ( $m \parallel n$ ).

Lines  $m$  and  $k$  are skew lines.

Planes  $T$  and  $U$  are parallel planes ( $T \parallel U$ ).

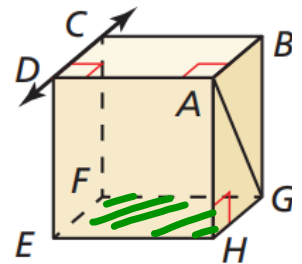
Lines  $k$  and  $n$  are intersecting lines, and there is a plane (not shown) containing them.

Small directed arrows, as shown in red on lines  $m$  and  $n$  above, are used to show that lines are parallel. The symbol  $\parallel$  means “is parallel to,” as in  $m \parallel n$ .

Segments and rays are parallel when they lie in parallel lines. A line is parallel to a plane when the line is in a plane parallel to the given plane. In the diagram above, line  $n$  is parallel to plane  $U$ .

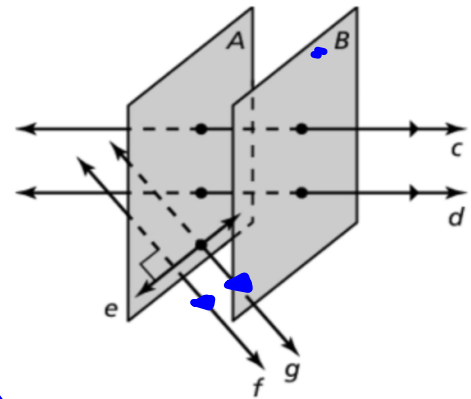
Think of each segment in the figure as part of a line.  
Which line(s) or plane(s) appear to fit the description?

- a. line(s) parallel to  $\overleftrightarrow{CD}$  and containing point A  $\overleftrightarrow{AB}$
- b. line(s) skew to  $\overleftrightarrow{CD}$  and containing point A  $\overleftrightarrow{AG}$   $\overleftrightarrow{AH}$
- c. line(s) perpendicular to  $\overleftrightarrow{CD}$  and containing point A  $\overleftrightarrow{AD}$
- d. plane(s) parallel to plane  $EFG$  and containing point A  $ADC$



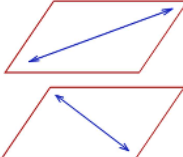
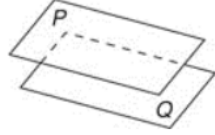
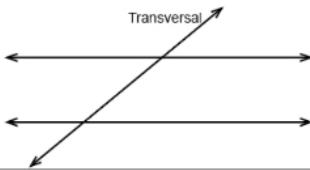
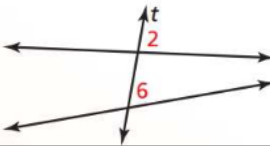
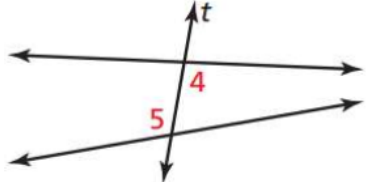
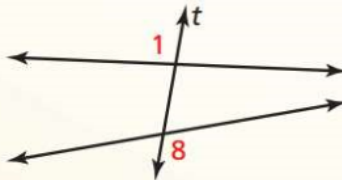
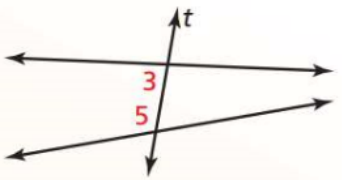
In Exercises 1-6, use the diagram.

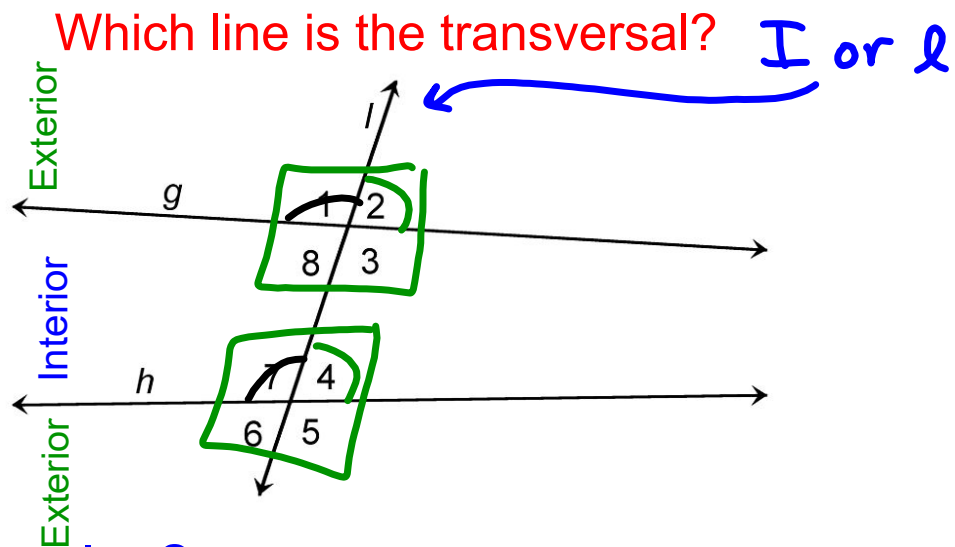
1. Name a pair of parallel lines.  $c \parallel d$   $c \parallel l$   $d \parallel l$
2. Name a pair of perpendicular lines.  $e \perp f$
3. Name a pair of skew lines.  $f \nparallel c$ ,  $e \nparallel c$ ,  $c \nparallel g$   $f \nparallel d$
4. Name a pair of parallel planes.  $A \parallel B$
5. Is line  $f$  parallel to line  $g$ ? Explain.  
not positive  $\rightarrow$  no arrows
6. Is line  $e$  perpendicular to line  $g$ ? Explain.  
no, it's not marked as such



## Lesson 10.1 - Pairs of Lines and Angles

**GOAL:** I can identify parallel and perpendicular lines and angles.

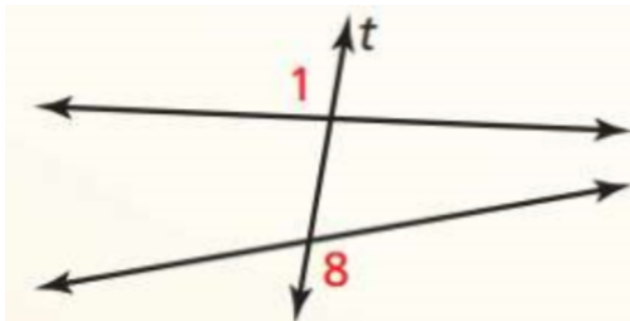
Word	Definition	Picture or Example
Skew lines	Lines that do not intersect and are not coplanar	
Parallel planes	Two planes that do not intersect	
Transversal	A line that intersects two or more lines	
Corresponding angles	Two angles with corresponding positions (top-left)	
Alternate interior angles	Two angles that lie <b>inside</b> the two lines and on opposite sides of the transversal	
Alternate exterior angles	Two angles that lie <b>outside</b> the two lines and on opposite sides of the transversal	
Consecutive interior angles	Two angles that lie inside the two lines and on the same side of the transversal	



Interior angles?  
8, 3, 7, 4

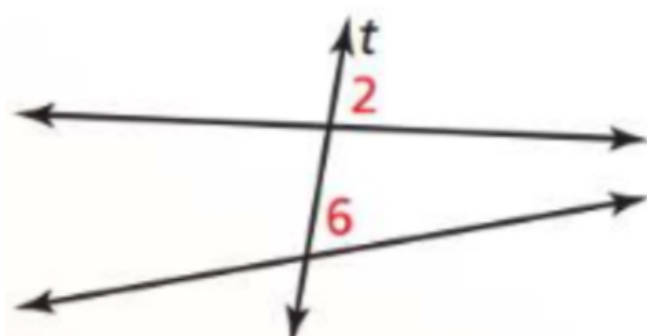
Exterior angles?  
1, 2, 6, 5

Identify the relationship of the angles shown

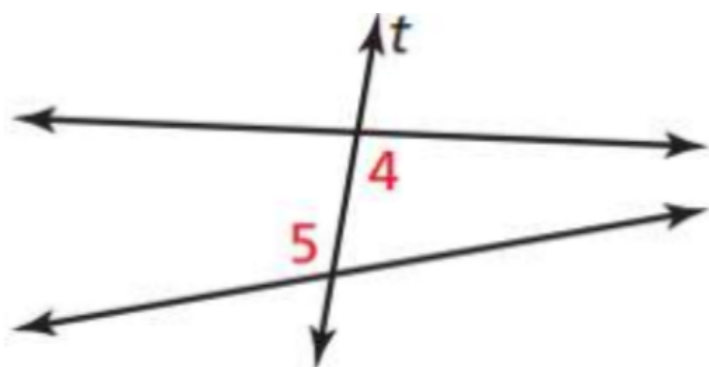




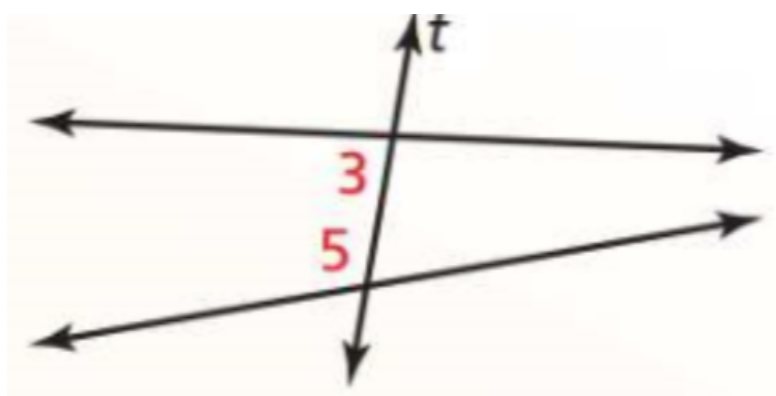
Identify the relationship of the angles shown



Identify the relationship of the angles shown

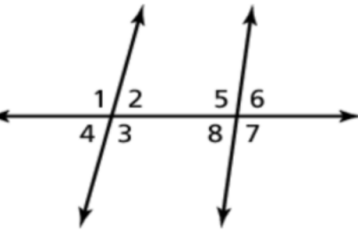


Identify the relationship of the angles shown



In Exercises 7-10, identify all pairs of angles of the given type.

- 7. alternate interior  $3 \leftrightarrow 5, 2 \leftrightarrow 8$
- 8. alternate exterior  $4 \leftrightarrow 6, 1 \leftrightarrow 7$
- 9. corresponding  $2 \leftrightarrow 6, 1 \leftrightarrow 5, 3 \leftrightarrow 7, 4 \leftrightarrow 8$
- 10. consecutive interior  $3 \leftrightarrow 8, 2 \leftrightarrow 5$



- 11. Is it possible to draw three lines in two planes such that all three lines are skew? Explain your reasoning.

No! 2 would have to be 11

12. Classify the angle pair.

a.  $\angle 3$  and  $\angle 5$

con. int

b.  $\angle 1$  and  $\angle 8$

alt. ext

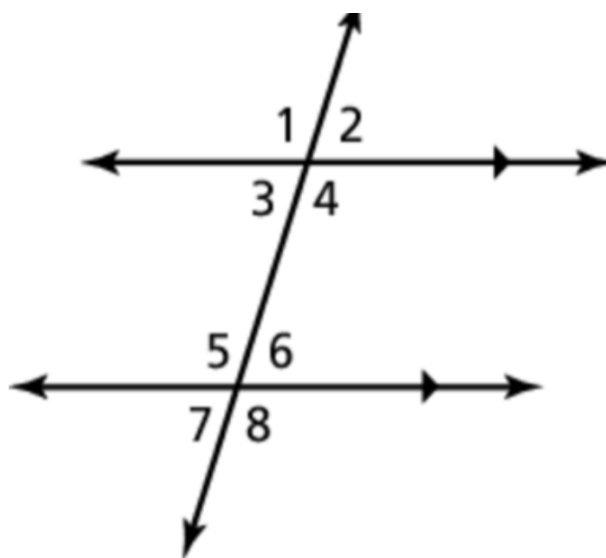
c.  $\angle 2$  and  $\angle 6$

corr

d.  $\angle 1$  and  $\angle 4$

vert

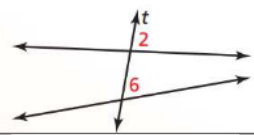
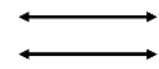
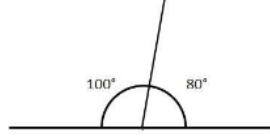
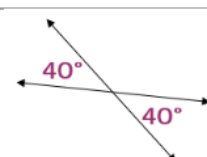
e.  $\angle 4$  and  $\angle 5$  alt int



I can identify alternate interior, alternate exterior, corresponding and same side interior angles

## Lesson 10.2 - Parallel Lines and Transversals

**GOAL:** I can use properties of parallel lines to solve unknown angles.

Word	Definition	Picture or Example
corresponding angles	Two angles with corresponding positions (top-left)	
parallel lines	Two lines in the same plane that do not intersect	
supplementary angles	Two angles that add up to 180°	
vertical angles	Opposite angles made by intersecting lines	

### Theorems

#### Corresponding Angles Theorem

If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent. In the diagram,  $\angle 2 \cong \angle 6$  and  $\angle 3 \cong \angle 7$ .

#### Alternate Interior Angles Theorem

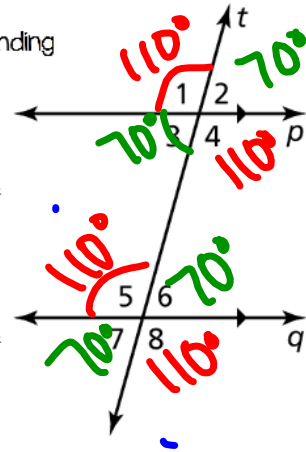
If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent. In the diagram,  $\angle 3 \cong \angle 6$  and  $\angle 4 \cong \angle 5$ .

#### Alternate Exterior Angles Theorem

If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent. In the diagram,  $\angle 1 \cong \angle 8$  and  $\angle 2 \cong \angle 7$ .

#### Consecutive Interior Angles Theorem

If two parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary. In the diagram,  $\angle 3$  and  $\angle 5$  are supplementary, and  $\angle 4$  and  $\angle 6$  are supplementary.

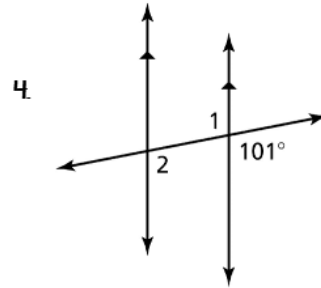
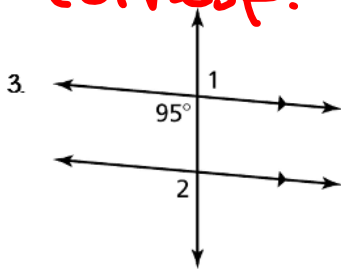


In Exercises 1-4, find  $m\angle 1$  and  $m\angle 2$ . Tell which theorem you use in each case.

1.  $m\angle 1 = 110^\circ$  - Alt. Int  $\textcircled{2}$

$m\angle 2 = 110^\circ$   $\angle 1 \cong \angle 2$  vertical corresp.

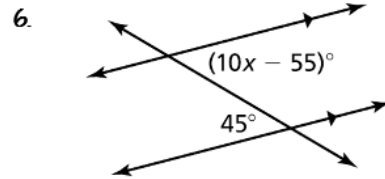
$m\angle 1 = 63^\circ$  corresp.  
 $m\angle 2 = 117^\circ$  consecutive int



In Exercises 5-8, find the value of  $x$ . Show your steps.

5.

$$\begin{array}{r} 110 = x + 12 \\ -12 \quad -12 \\ \hline x = \end{array}$$



$$\begin{array}{r} 2x - 55 = 45 \\ +55 \quad +55 \\ \hline 2x = 100 \\ \div 2 \quad \div 2 \\ \hline x = 50 \end{array}$$

7.

$\angle 6 = 52$

$$\begin{array}{r} 4x + 52 = 180 \\ -52 \quad -52 \\ \hline 4x = 128 \\ \div 4 \quad \div 4 \\ \hline x = 32 \end{array}$$

8.

$$\begin{array}{r} 2x - 3 = 153 \\ +3 \quad +3 \\ \hline 2x = 156 \\ \div 2 \quad \div 2 \\ \hline x = 78 \end{array}$$



due Thurs 1/2

10.1 and 10.2 online hw

pg 501-502 #s 1, 2, 3-21 odd

pg 507-508 #s 2, 3-13 odd