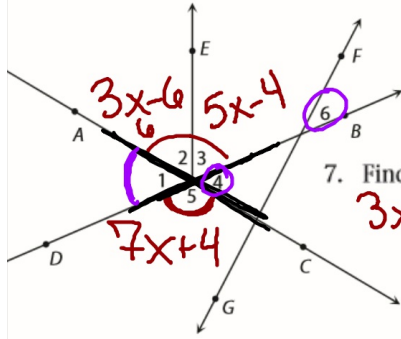


Warm-up
Have your homework out



$$7(14) + 4$$

$$98 + 4$$

$$102^\circ$$



7. Find $m\angle 5$ if $m\angle 2 = 3x - 6$, $m\angle 3 = 5x - 4$, and $m\angle 5 =$

$$3x - 6 + 5x - 4 = 7x + 4$$

$$8x - 10 = 7x + 4$$

$$\begin{array}{r} 8x - 10 = 7x + 4 \\ -7x \quad -7x \\ \hline x - 10 = 4 \end{array}$$

$$x - 10 = 4 \quad x = 14$$

8. Find $m\angle 1$ if $\angle 4$ and $\angle 6$ are complementary, $m\angle 4 = 2x - 8$, and $m\angle 6 = 2x - 14$.

$$2x - 8 + 2x - 14 = 90$$

$$4x - 22 = 90$$

$$\begin{array}{r} 4x - 22 = 90 \\ +22 \quad +22 \\ \hline 4x = 112 \\ \frac{4x}{4} = \frac{112}{4} \end{array}$$

$$x = 28$$

$$2(28) - 8$$

$$56 - 8$$

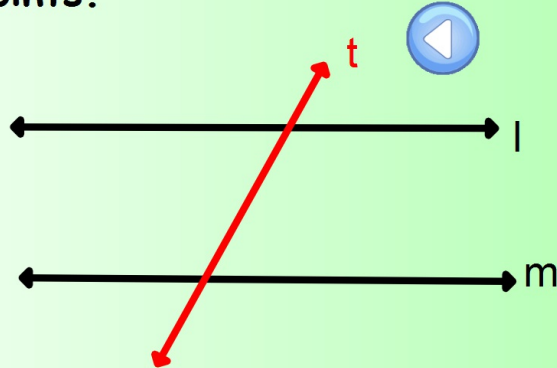
$$48$$

OBJECTIVES

- ▶ Define parallel lines
- ▶ State the results of transversal falling on parallel lines
- ▶ List the angles formed due to the transversal.
- ▶ State the characteristics of these angles
- ▶ Activities related to parallel lines and transversal

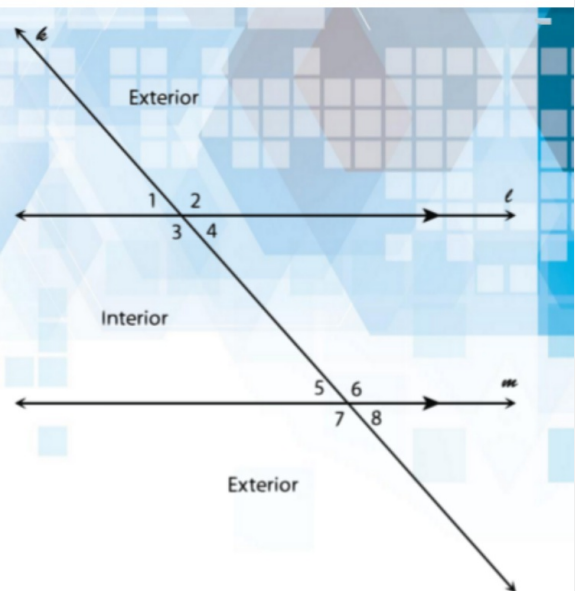
Transversal

A transversal is a line that intersects two or more lines in a plane (intersecting or parallel) at different points.



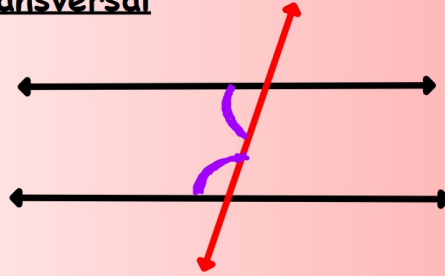
t is the transversal

The interior angles lie between the parallel lines and the exterior angles lie outside the pair of parallel lines. In the following diagram, line k is the transversal. A **transversal** is a line that intersects a system of two or more lines. Lines l and m are parallel. The exterior angles are $\angle 1$, $\angle 2$, $\angle 7$, and $\angle 8$. The interior angles are $\angle 3$, $\angle 4$, $\angle 5$, and $\angle 6$.



Angles Made by a Transversal with Two Parallel Lines

1. Interior Angles on the same side of the Transversal

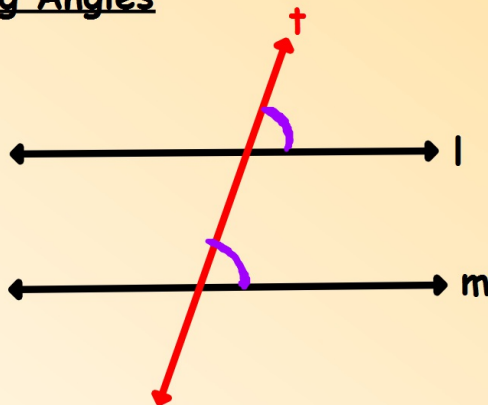


When a transversal cuts a pair of parallel lines the sum of

interior angles on the same side of the transversal is always equal to 180°



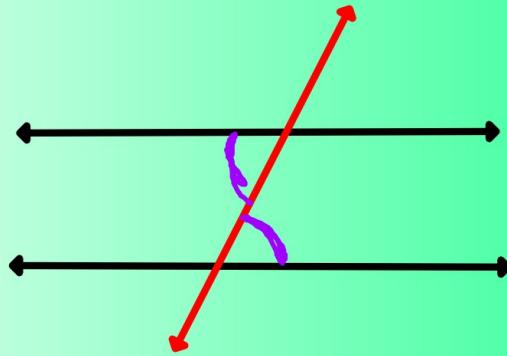
2. Corresponding Angles



When a transversal cuts a pair of parallel lines, the corresponding angles are equal.



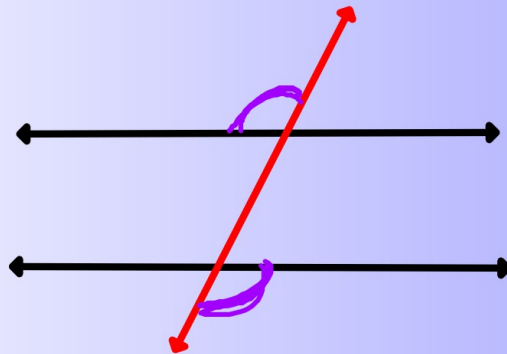
3. Alternate Interior Angles



When a transversal cuts a pair of parallel lines, the pairs of **alternate interior angles** are **equal**



4. Alternate Exterior Angles



When a transversal cuts a pair of parallel lines, the pairs of **alternate exterior angles** are **equal**



TEST FOR PARALLEL LINES

Some of those special **pairs of angles** can be used to test if lines really are parallel:

	If Any Pair Of...	<i>Example:</i>
	<u>Corresponding Angles</u> are equal, or	$a = e$
	<u>Alternate Interior Angles</u> are equal, or	$c = f$
	<u>Alternate Exterior Angles</u> are equal, or	$b = g$
	<u>Consecutive Interior Angles</u> add up to 180°	$d + f = 180^\circ$
... then the lines are Parallel		

Guided Practice

Example 3

In the diagram, $\overline{AB} \parallel \overline{CD}$ and $\overline{AC} \parallel \overline{BD}$. If

- * $m\angle 1 = 3(x + 15)$,
- * $m\angle 2 = 2x + 55$, and
- $m\angle 3 = 4y + 9$, find the measures of the unknown angles and the values of x and y .

$$3(x+15) + 2x+55 = 180$$

$$3x+45 + 2x+55 = 180$$

$$5x+100 = 180$$

$$\begin{array}{r} 5x+100 = 180 \\ -100 \quad -100 \\ \hline 5x = 80 \\ \frac{5x}{5} = \frac{80}{5} \\ x = 16 \end{array}$$

$$3(16+15)$$

$$3(31)$$

$$93^\circ$$

$$2(16)+55$$

$$87$$

$$m\angle 1 = 93^\circ$$

$$m\angle 2 = 87^\circ$$

$$m\angle 3 = 93^\circ$$

$$4y+9=93$$

$$\begin{array}{r} 4y+9=93 \\ -9 \quad -9 \\ \hline 4y=84 \\ y=21 \end{array}$$

Guided Practice

Example 4

In the diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.

If $m\angle 1 = 35$ and

$m\angle 2 = 65$, find $m\angle EQF$.

$$\begin{array}{r} 35 \\ + 65 \\ \hline 100^\circ \end{array}$$

