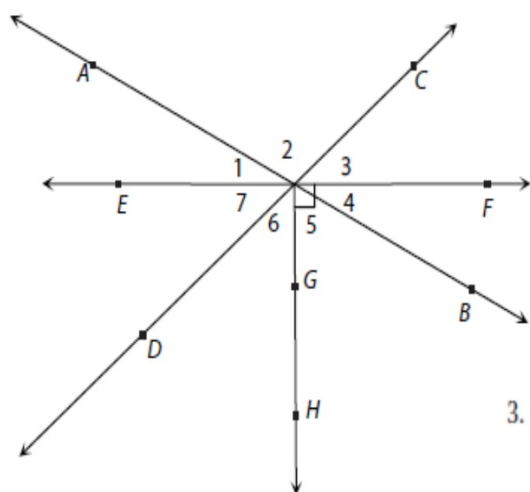




Do Now

Calculators / 2 different colored pencils



1. List two pairs of adjacent angles and two pairs of nonadjacent angles.

Blank blue box for student response to question 1.

2. List three angles that altogether are supplementary angles. Write a statement about those angles using the Supplement Theorem.

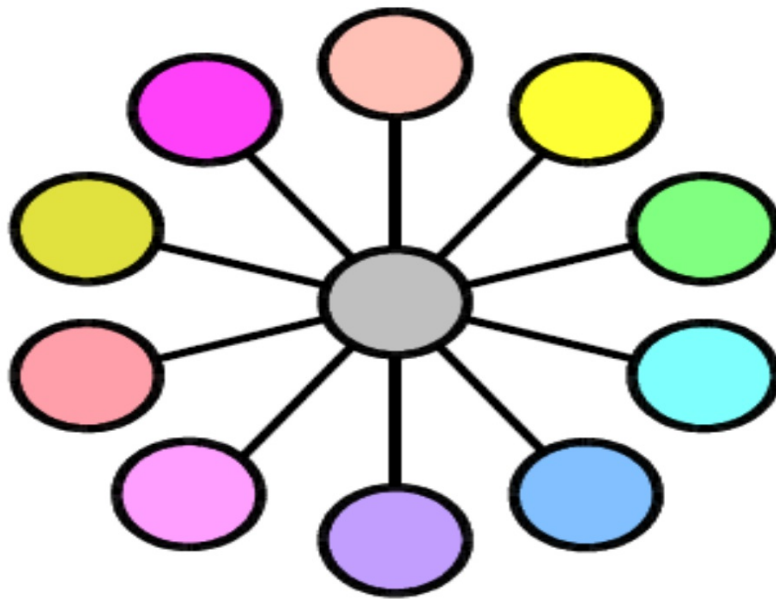
Blank blue box for student response to question 2.

3. List a pair of vertical angles. Write a statement about those angles using the Vertical Angles Theorem.

Blank blue box for student response to question 3.

Check In!

Can you put the digits 1 to 11 in the circles so that every line has the same total?

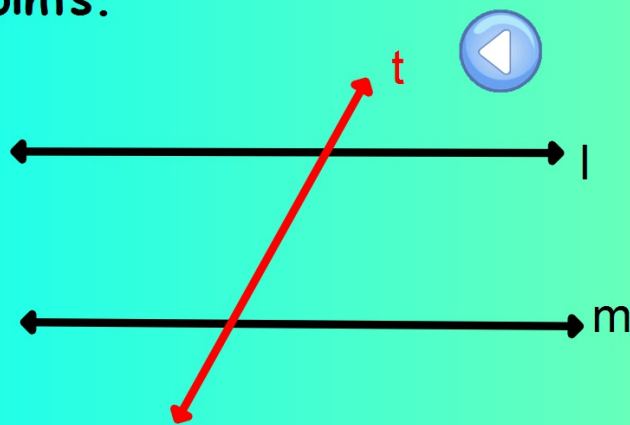


OBJECTIVES

- ▶ **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**

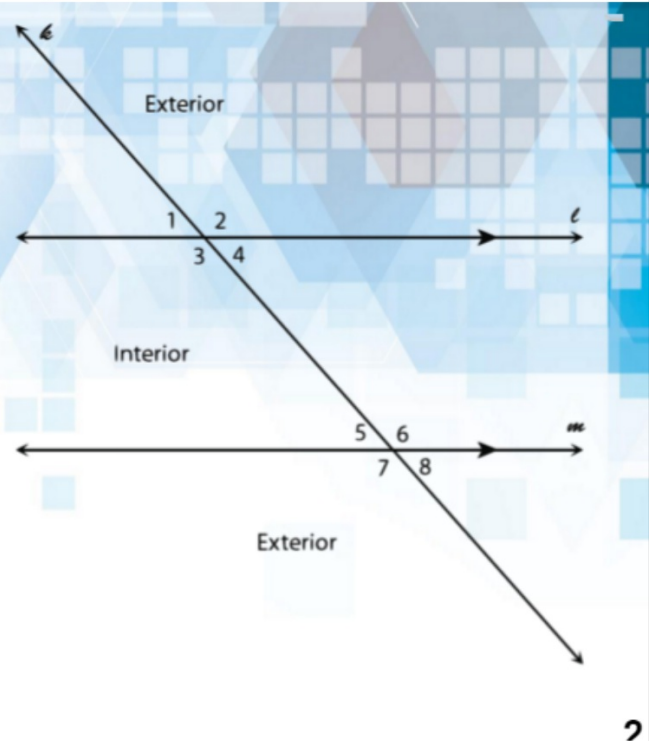
Transversal

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



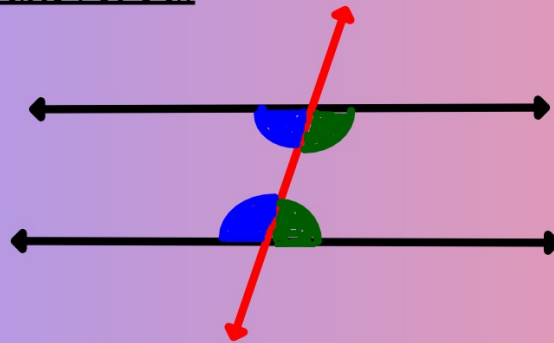
t is the transversal

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

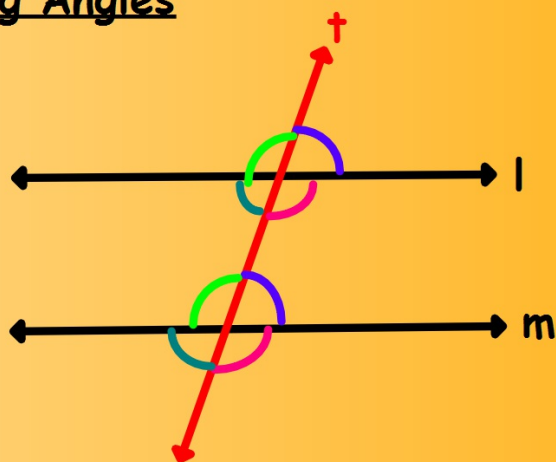
1. Interior Angles on the same side of the Transversal



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°



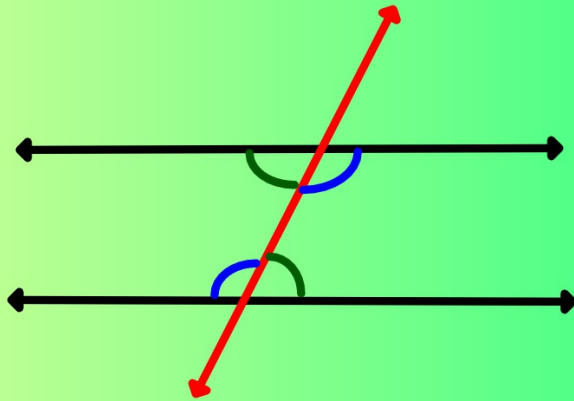
2. Corresponding Angles



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



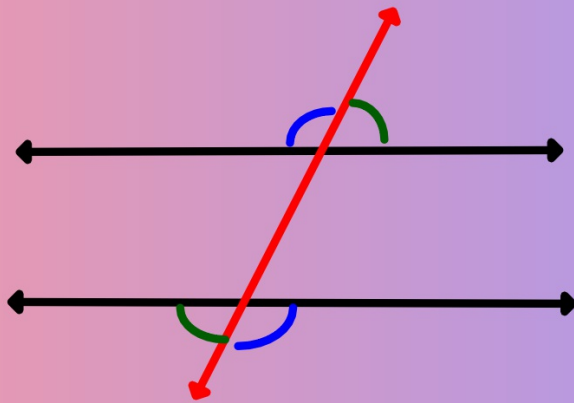
3. Alternate Interior Angles



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



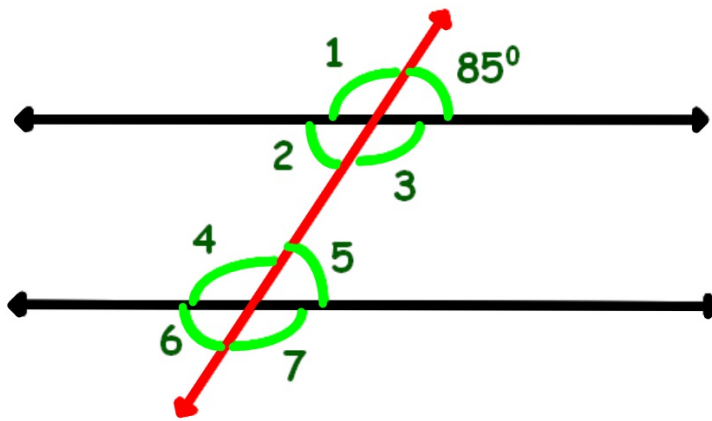
TEST FOR PARALLEL LINES

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	

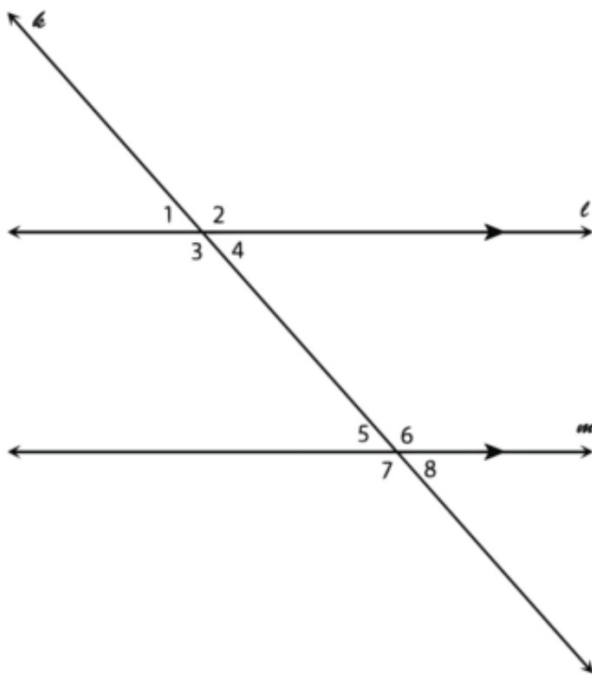
Activity 2

Q. Find the measures of the following angles:-



$$\angle 1 = 95^\circ \quad \angle 2 = 85^\circ \quad \angle 3 = 95^\circ$$

$$\angle 4 = 95^\circ \quad \angle 5 = 85^\circ \quad \angle 6 = 95^\circ$$



Name a pair of interior angles:

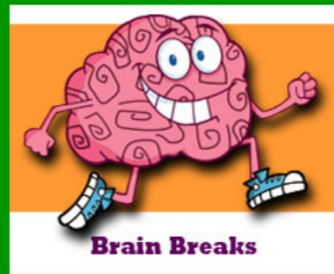
Name a pair of alt. interior angles:

Name a pair of alt. exterior angles:

Name a pair of corresponding angles:

.. .

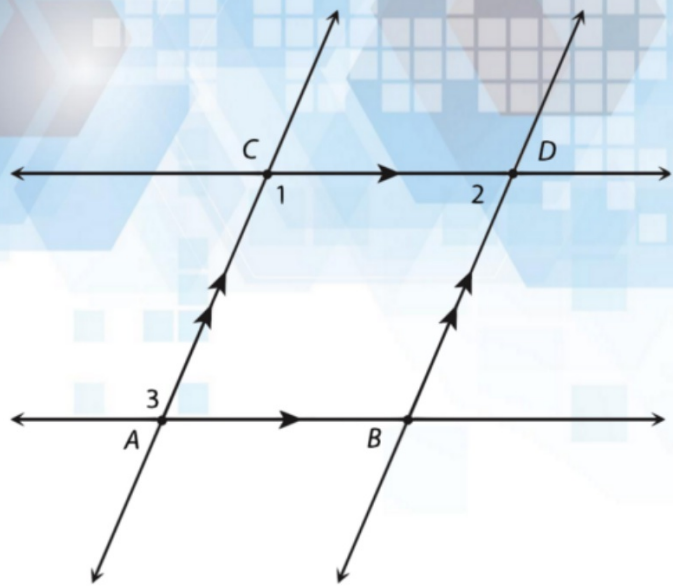
Brain Break!



Guided Practice

Example 3

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



Guided Practice: Example 3, *continued*

3. Use substitution and solve for x .

$$\begin{aligned}m\angle 1 &= 3(x + 15) \text{ and} \\m\angle 2 &= 2x + 55\end{aligned}$$

Given

$$m\angle 1 + m\angle 2 = 180$$

Same-Side Interior Angles Theorem

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

Substitute $3(x + 15)$ for $m\angle 1$ and $2x + 55$ for $m\angle 2$.

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

Distribute.

$$5x + 100 = 180$$

Combine like terms.

$$5x = 80$$

Subtract 100 from both sides of the equation.

$$x = 16$$

Divide both sides by 5.

Guided Practice: Example 3, *continued*

4. Find $m\angle 1$ and $m\angle 2$ using substitution.

$$m\angle 1 = 3(x + 15); x = 16$$

$$m\angle 2 = 2x + 55; x = 16$$

$$m\angle 1 = [3(16) + 15]$$

$$m\angle 2 = 2(16) + 55$$

$$m\angle 1 = 3(31)$$

$$m\angle 2 = 32 + 55$$

$$m\angle 1 = 93$$

$$m\angle 2 = 87$$

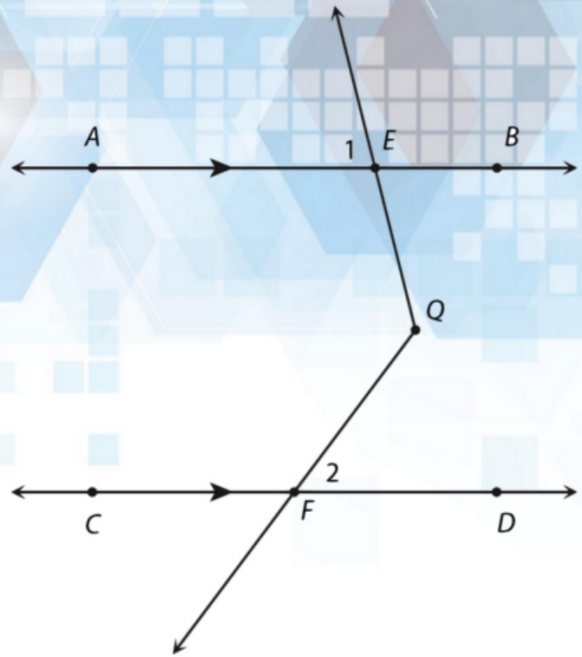
Guided Practice

Example 4

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

If $m\angle 1 = 35$ and

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

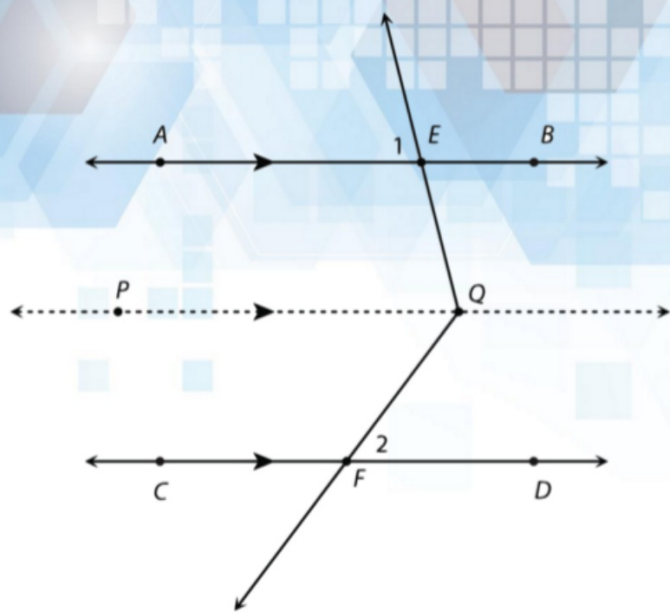


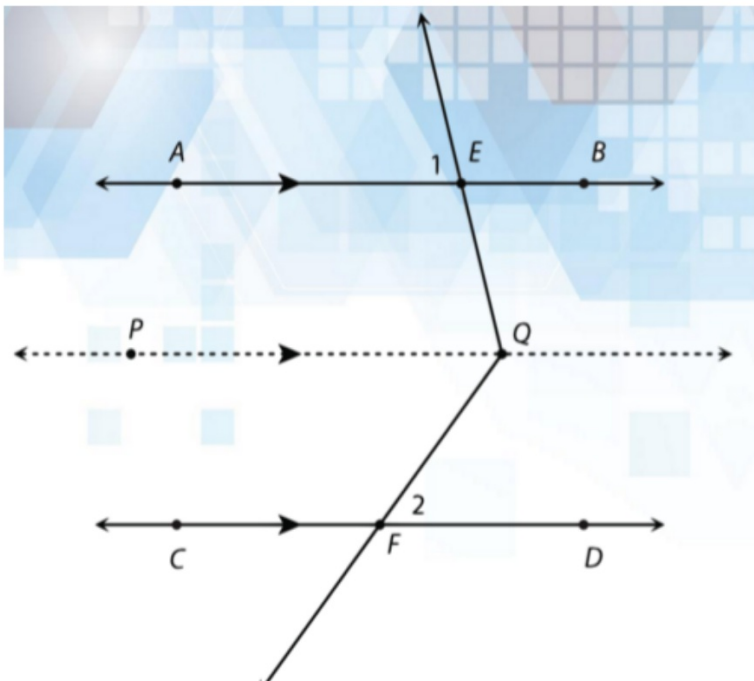
Guided Practice: Example 4, *continued*

1. Draw a third parallel line that passes through point Q .

Label a second point on the line as P .

$$\overleftrightarrow{PQ} \parallel \overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$$





Independent Practice!

- Go to Google Classroom.
- "In Class Activity 11/04/2016"
- You have till end of the class. Follow instructions on Google Classroom.
- Solutions are in the back!



