# Lesson 3.1:

# Parallel Lines and Transversals
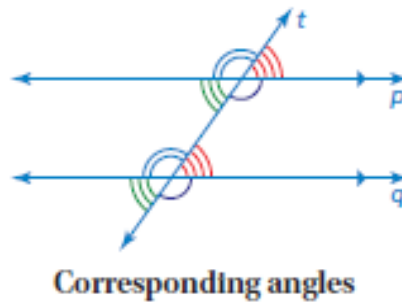
# Essential Question

How can you describe angles formed by

parallel lines and transversals?
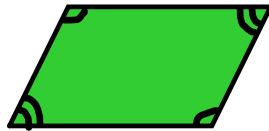
## Key Idea

**Corresponding Angles**
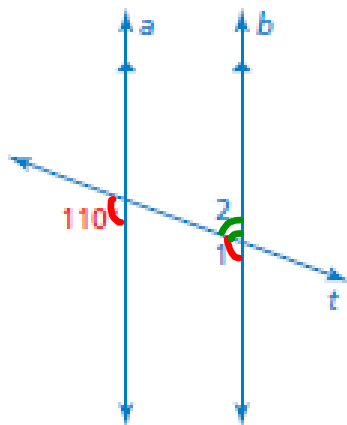
When a transversal intersects parallel lines, corresponding angles are congruent.

**Corresponding angles**

*Just like angles of parallelograms!*

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**Use the figure to find the measures of (a) $\angle$ 1 and (b) $\angle$ 2.**

$<1 = 110°$

The 110º angle and <1 are corresponding angles.

$<2 = 70°$
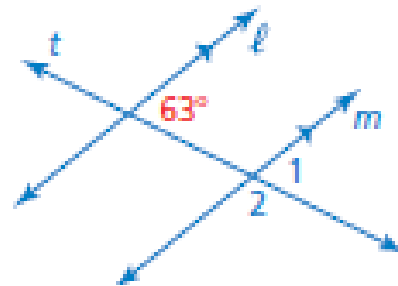
<1 and <2 are supplementary angles.

**Use the figure to find the measure of the angle. Explain your reasoning.**
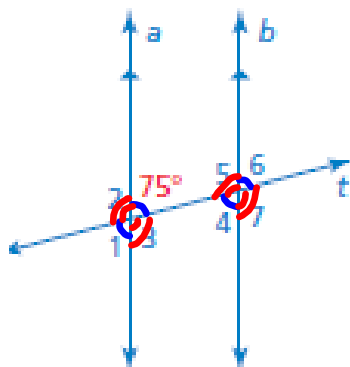
**1.** $\angle 1$  $63°$

Corresponding angles

**2.** $\angle 2$  $117°$

Supplementary angles

$$
\begin{array}{r}
1\overset{7}{\cancel{8}}0 \\
-\ 63 \\
\hline
117
\end{array}
$$

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**Use the figure to find the measures of the numbered angles.**

$<1, <4, <6 = 75°$

$<2, <3, <5, <7 = 105°$

$$
\begin{array}{r}
1\overset{7}{\cancel{8}}0 \\
-\ 75 \\
\hline
105
\end{array}
$$

**3.** Use the figure to find the measures of the numbered angles.

$<2, <5, <7 = 59°$
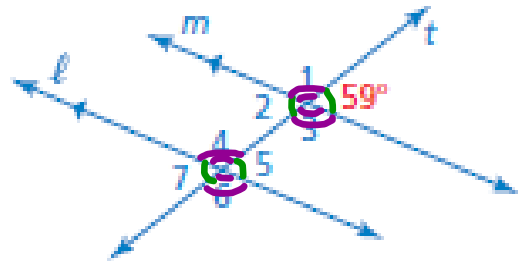
$<1, <3, <4, <6 = 121°$

$\begin{array}{r} 1\overset{7}{8}0 \\ -\ 59 \\ \hline 121 \end{array}$

A store owner uses pieces of tape to paint a window advertisement. The letters are slanted at an 80° angle. What is the measure of ∠1?

(A) 80°    ● 100°    (C) 110°    (D) 120°
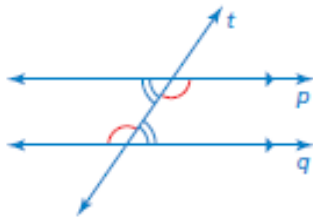
$\begin{array}{r} 180 \\ -\ 80 \\ \hline 100 \end{array}$

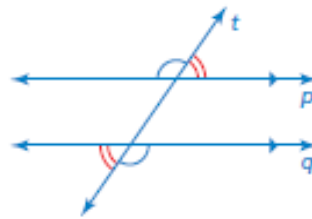<1 is supplementary to the angle that is corresponding to the 80° angle.

🔑 **Key Idea**

**Alternate Interior Angles and Alternate Exterior Angles**
When a transversal intersects parallel lines, alternate interior angles
are congruent and alternate exterior angles are congruent.

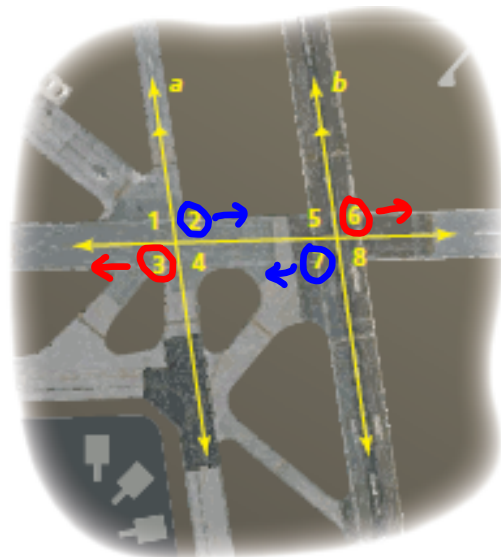Alternate interior angles                    Alternate exterior angles

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**The photo shows a portion of an airport. Describe the relationship between each pair of angles.**

**a.** $\angle$ 3 and $\angle$ 6

   Alternate exterior angles

**b.** $\angle$ 2 and $\angle$ 7

   Alternate interior angles

In Example 4, the measure of ∠4 is 84°. Find the measure of each of the angles. Explain your reasoning.

**5.** ∠3

96°     Supplementary

**6.** ∠5

84°     Alternate interior

**7.** ∠6

96°     Supplementary to corresponding