ANGLE RELATIONSHIPS

Parallel Lines Cut by a Transversal

Corresponding Angles
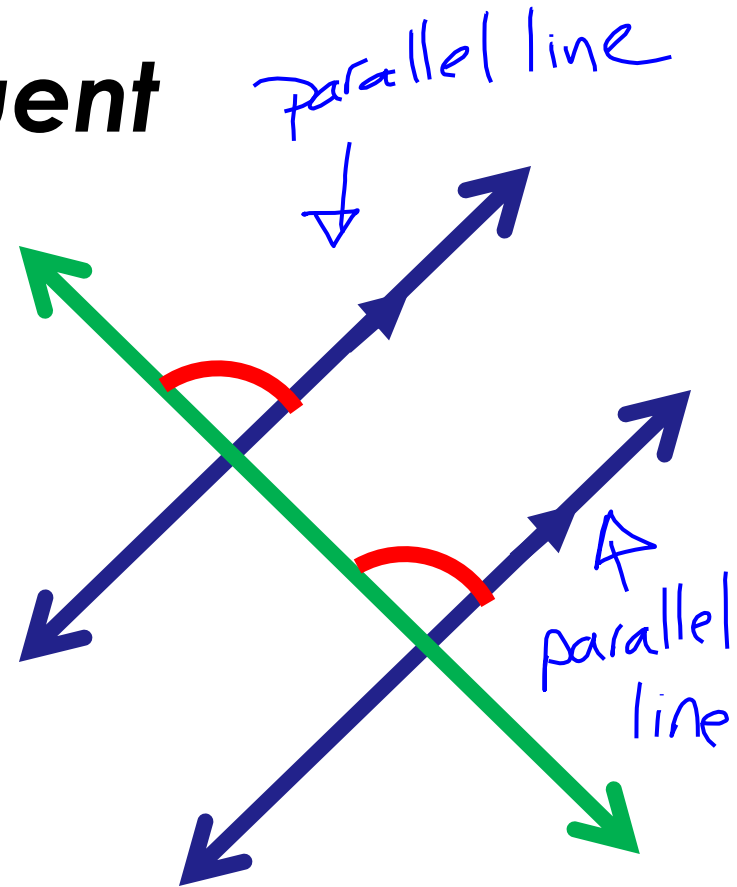
- **Same side of transversal but on different parallel lines**

- ***Non-adjacent, congruent***

Equation:

angle = angle

parallel line

transversal

parallel line
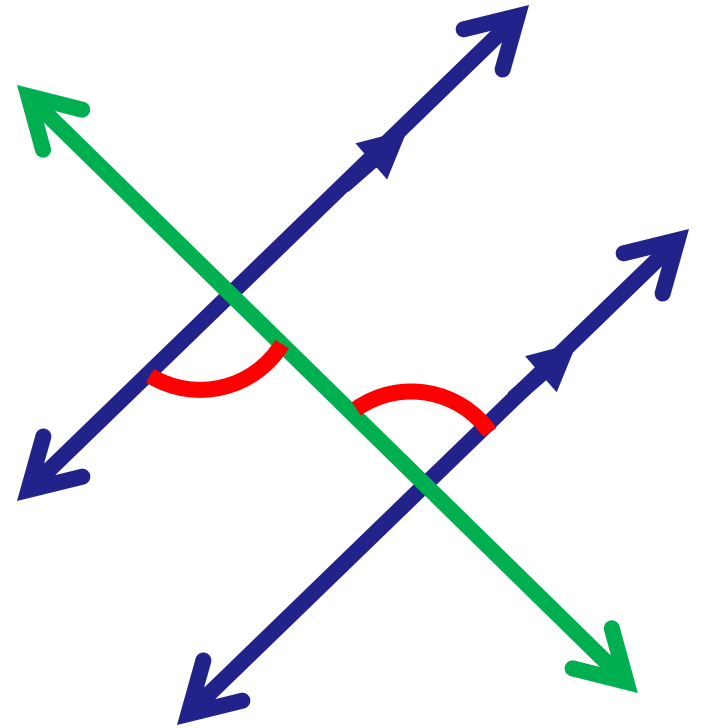
Alternate Interior Angles

- **Opposite sides of the transversal & inside the parallel lines**
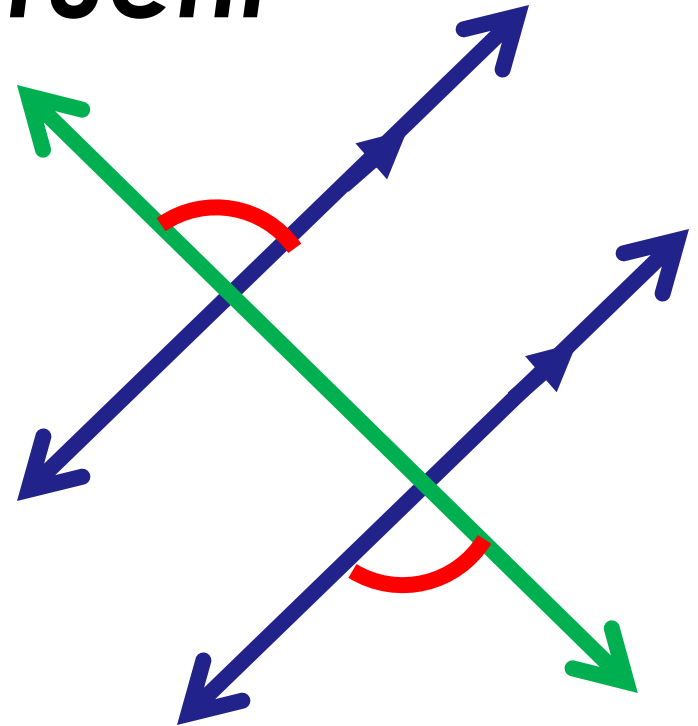
- *Non-adjacent, congruent*

Equation:

angle = angle

Alternate Exterior Angles

- **Opposite sides of the transversal & outside the parallel lines**
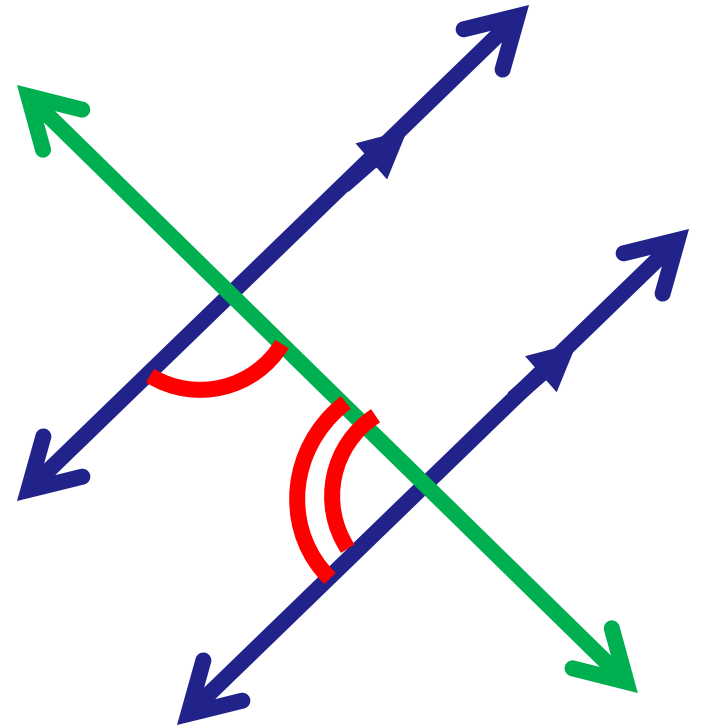
- ***Non-adjacent, congruent***

Equation:

angle = angle

Same-Side Interior Angles

- ## Same side of the transversal and inside the parallel lines

- ## *Supplementary (add up to 180˚)*

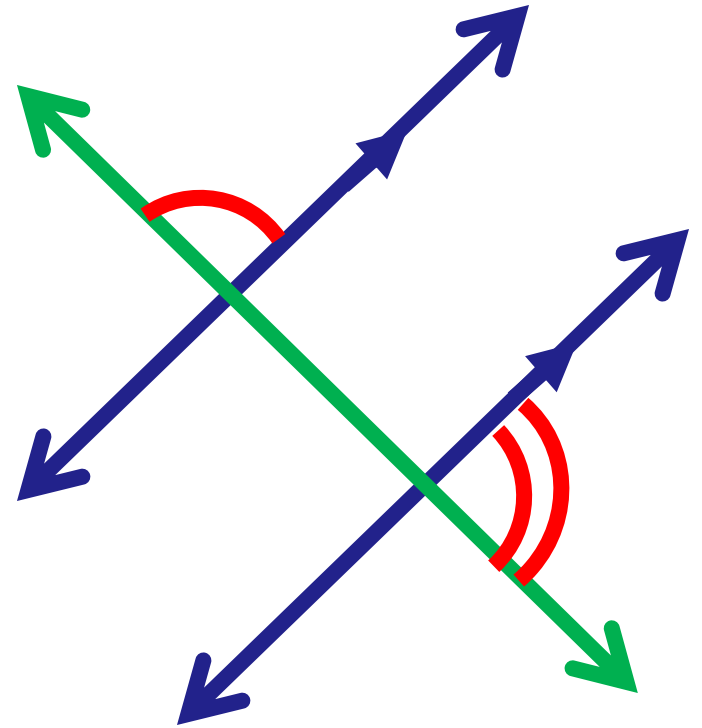Equation:

angle + angle = 180°

Same-Side Exterior Angles

- **Same side of the transversal and outside the parallel lines**

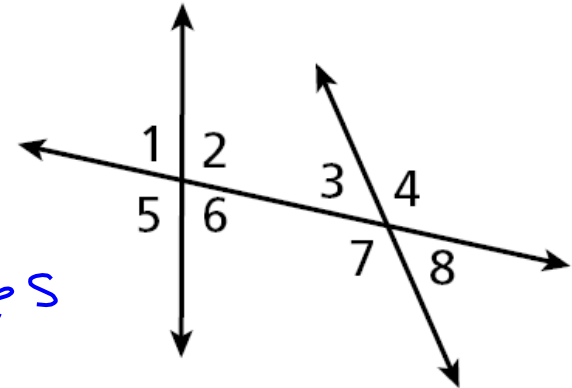- *Supplementary (add up to 180˚)*

Equation:

angle + angle = 180°

Identify each angle pair.

1. ∠1 and ∠3   *corresponding angles*

2. ∠3 and ∠6   *alternate interior angles*

3. ∠4 and ∠5   *alternate exterior angles*

4. ∠6 and ∠7   *same-side interior angles*

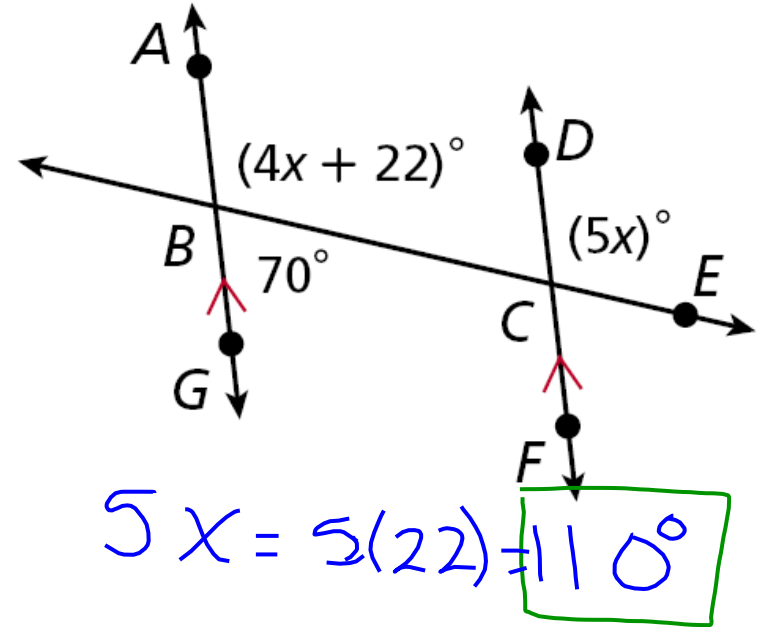# Example 1: Using the Corresponding Angles Postulate

Find each angle measure.

A. m∠ECF $= \boxed{70°}$

B. m∠DCE

$$4x + 22 = 5x$$
$$-4x \qquad\qquad -4x$$
$$x = 22$$

m∠DCE

Diagram labels:

A

$(4x + 22)°$ D

B $(5x)°$ E

$70°$ C

G   F

$$5x = 5(22) = \boxed{110°}$$

Example 1

Find m∠QRS.

$$118 + x = 180$$
$$-118 \qquad\qquad -118$$
$$x = 62°$$
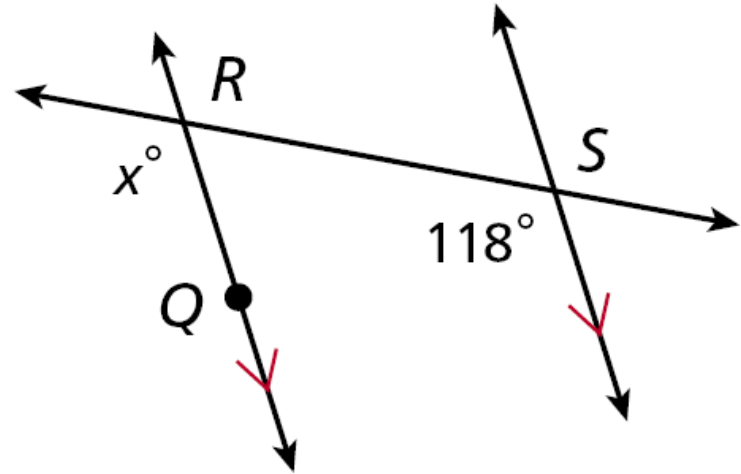
Example 2: Finding Angle Measures

Find each angle measure.

A. m∠EDG $= 75°$

B. m∠BDG $= 115°$

$$x - 30 = 75$$
$$+30 \quad +30$$
$$x = 115°$$

F

A B $75°$ C

$(2x - 135)°$

G $x°$

$(x - 30)°$ D

E
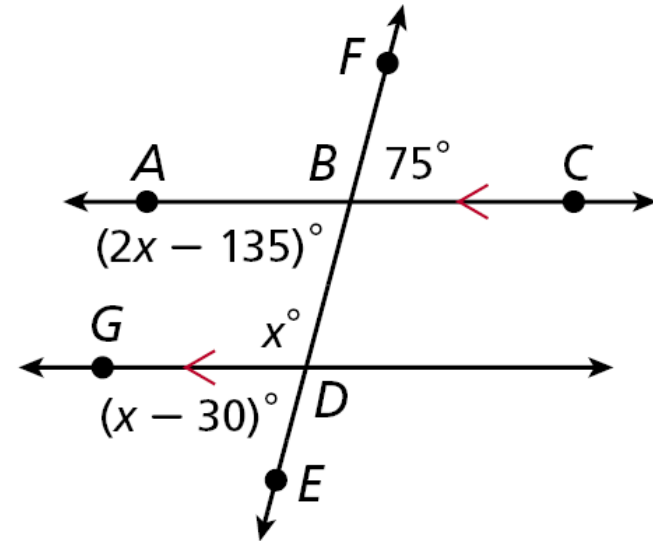
Example 2

Find m∠ABD.

A B C

$(2x + 10)°$

$(3x - 15)°$

D E

$2x + 10 = 3x - 15$

$-2x \qquad\qquad -2x$

$10 = x - 15$

$+15 \qquad +15$

$x = 25$

$2x + 10 = 2(25) + 10$

$= \boxed{60°}$