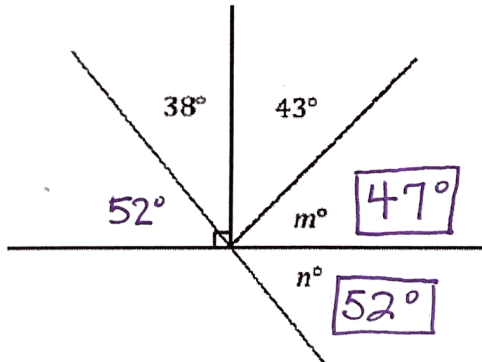


Pre-Algebra

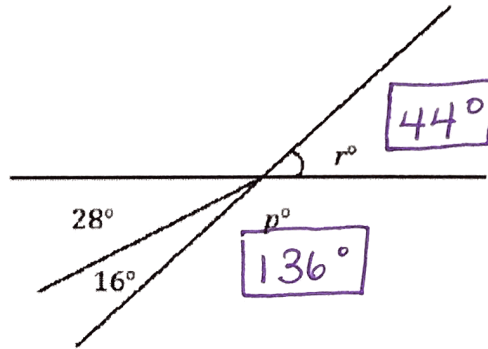
Aim: How can we use angle relationships to solve word problems?

Do Now: Angles on a line sum to  $180^\circ$ .

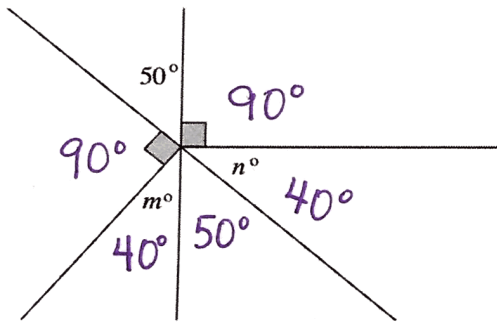
1. Find the value of  $m$  and  $n$ .



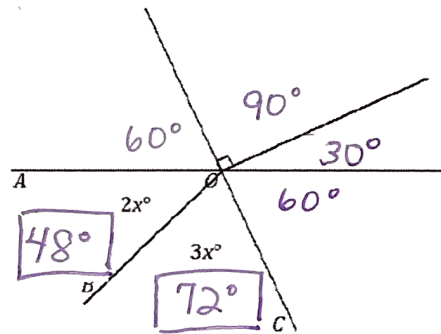
2. Find the value of  $p$  and  $r$ .



3. Find the value  $m$  and  $n$ .



4. Find the measure of angles  $AOB$  and  $BOC$ .



$$\begin{aligned} 5x + 60 &= 180 \\ 5x &= 120 \\ x &= 24 \end{aligned}$$

Solve each word problem using your knowledge of angle pair relationships.

1. Two angles are supplementary. The  $m \angle A = 77^\circ$  and the  $m \angle B = 3x - 2$ . Find the value of  $x$ .

$$\begin{aligned} 77^\circ &= 1^{\text{st}} \text{ angle} \\ \boxed{103^\circ} \quad 3x - 2 &= 2^{\text{nd}} \text{ angle} \end{aligned}$$

$$\begin{aligned} 3x - 2 + 77 &= 180 \\ 3x + 75 &= 180 \\ 3x &= 105 \end{aligned}$$

$$\boxed{x = 35}$$

2. Two angles are supplementary. One angle is 30 degrees more than twice the measure of the other. Find the measure of both angles.

$$\begin{aligned} \boxed{50^\circ} \quad x &= 1^{\text{st}} \text{ } \neq \\ \boxed{130^\circ} \quad 2x + 30 &= 2^{\text{nd}} \text{ } \neq \end{aligned}$$

$$\begin{aligned} 2x + 30 + x &= 180 \\ 3x + 30 &= 180 \\ 3x &= 150 \end{aligned}$$

$$\boxed{x = 50}$$

3. The measure of the complement of an angle is 4 times the measure of the angle.

Find the measure of the angle.

$$\boxed{18^\circ} \quad x = 1^{\text{st}} \angle$$

$$\boxed{72^\circ} \quad 4x = 2^{\text{nd}} \angle$$

$$x + 4x = 90$$

$$5x = 90$$

$$x = 18$$

4. The expressions  $5w - 20$  and  $2w + 16$  represent the measures in degrees of a pair of vertical angles.

a. Find the value of  $w$ .

$$\boxed{40^\circ} \quad 5w - 20 = 1^{\text{st}} \angle$$

$$5w - 20 = 2w + 16$$

$$\boxed{40^\circ} \quad 2w + 16 = 2^{\text{nd}} \angle$$

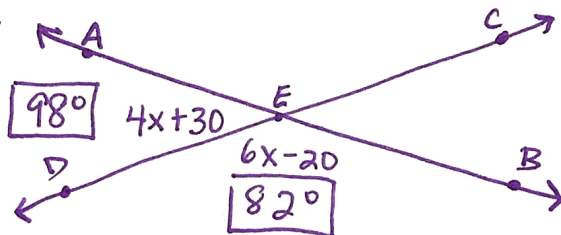
$$3w = 36$$

b. Find the measure of each angle.

$$\boxed{w = 12}$$

5. Line AB and Line CD intersect at point E.  $m\angle AED = 4x + 30$  and  $m\angle DEB = 6x - 20$ .

Find the measure of  $\angle DEB$ .



$$4x + 30 + 6x - 20 = 180$$

$$10x + 10 = 180$$

$$10x = 170$$

$$x = 17$$

6. Two angles are complementary and congruent. What is the measure of each angle?

$$\boxed{45^\circ} \quad x = 1^{\text{st}} \angle$$

$$x + x = 90$$

$$\boxed{45^\circ} \quad x = 2^{\text{nd}} \angle$$

$$2x = 90$$

$$\boxed{x = 45}$$

7. The measurement of the complement of an angle exceeds the measure of the angle by 25%.

Find the angle and its complement.

$$\boxed{40^\circ} \quad x = 1^{\text{st}} \angle$$

$$x + 1.25x = 90$$

$$\boxed{50^\circ} \quad 1.25x = 2^{\text{nd}} \angle$$

$$2.25x = 90$$

$$x = 40$$

8. The ratio of the measurement of an angle to its supplement is 3:5. Find the angle and its supplement.

$$\boxed{67.5^\circ} \quad 3x = 1^{\text{st}} \angle$$

$$3x + 5x = 180$$

$$\boxed{112.5^\circ} \quad 5x = 2^{\text{nd}} \angle$$

$$8x = 180$$

$$x = 22.5$$