

Geometry Word Problem Warm-Up!

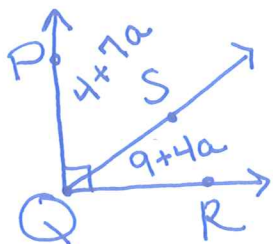
Name _____

Practice 1.5B

Date _____

Draw a picture to represent each problem. Then write an equation and solve.

1. Rays PQ and QR are perpendicular. Point S lies in the interior of $\angle PQR$. If $m\angle PQS = 4 + 7a$ and $m\angle SQR = 9 + 4a$, find the $m\angle PQS$ and $m\angle SQR$.



$$\begin{aligned} \angle PQR &= 90^\circ \quad \text{def of } \perp \\ \angle PQS + \angle SQR &= \angle PQR \quad \text{Angle Addition} \\ 4 + 7a + 9 + 4a &= 90 \\ 11a + 13 &= 90 \\ 11a &= 77 \\ \boxed{a} &= \boxed{7} \end{aligned}$$

$$\begin{aligned} \angle PQS &= 4 + 7(7) \\ \boxed{m\angle PQS} &= \boxed{53^\circ} \\ \angle SQR &= 9 + 4(7) \\ \boxed{m\angle SQR} &= \boxed{37^\circ} \end{aligned}$$

2. The measure of the supplement of an angle is 60 less than three times the measure of the complement of the angle. Find the measure of the angle.

*oops!
wow!*

$$x + y = 180$$

$$y + z = 90$$

$$x = \boxed{3z - 60}$$

$$y = \boxed{90 - z}$$

$$3z - 60 + 90 - z = 180$$

$$2z + 30 = 180$$

$$2z = 150$$

$$\boxed{z} = \boxed{75}$$

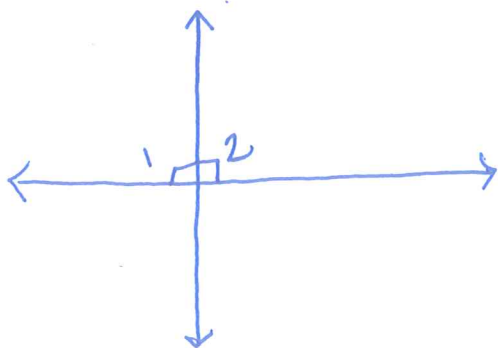
$$y + 75 = 90$$

$$\boxed{y} = \boxed{15}$$

$$3(75) - 60 = x$$

$$\boxed{165} = x$$

3. Lines p and q intersect to form adjacent angles 1 and 2. If $m\angle 1 = 3x + 18$ and $m\angle 2 = -8y - 70$, find the values of x and y so that p is perpendicular to q .



$$\angle 1 = 90^\circ \quad \text{def of } \perp$$

$$3x + 18 = 90$$

$$3x = 72$$

$$\boxed{x} = \boxed{24}$$

$$\angle 2 = 90^\circ \quad \text{def of } \perp$$

$$-8y - 70 = 90$$

$$-8y = 160$$

$$\boxed{y} = \boxed{-20}$$

4. The measure of an angle's supplement is 44 less than the measure of the angle. Find the measure of the angle and its supplement.

$$x + y = 180$$

$$x = y - 44$$

$$y - 44 + y = 180$$

$$2y - 44 = 180$$

$$2y = 224$$

$$\boxed{y} = \boxed{112^\circ}$$

$$x + 112 = 180$$

$$\boxed{x} = \boxed{68^\circ}$$

5. Two angles are supplementary. One angle measures 12° more than the other. Find the measures of the angles.

$$x + y = 180$$

$$x = y + 12$$

$$y + 12 + y = 180$$

$$2y + 12 = 180$$

$$2y = 168$$

$$y = 84$$

$$x + 84 = 180$$

$$x = 96$$

6. The measure of $\angle 1$ is five less than four times the measure of $\angle 2$. If $\angle 1$ and $\angle 2$ form a linear pair, what are their measures?

$$\angle 1 = 4\angle 2 - 5$$

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

$$\angle 1 + 37 = 180$$

$$4\angle 2 - 5 + \angle 2 = 180$$

$$5\angle 2 - 5 = 180$$

$$5\angle 2 = 185$$

$$\angle 2 = 37$$

$$\angle 1 = 143$$

7. The measures of two complementary angles are $16z - 9$ and $4z + 3$. Find the measures of the angles.

$$16z - 9 + 4z + 3 = 90$$

$$20z - 6 = 90$$

$$20z = 96$$

$$z = 4.8$$

$$16(4.8) - 9 = 67.8$$

$$4(4.8) + 3 = 22.2$$

8. Find $m\angle T$, if $m\angle T$ is 20 more than four times the measure of its supplement.

$$\angle T = 4x + 20$$

$$x + \angle T = 180$$

$$x + 4x + 20 = 180$$

$$5x + 20 = 180$$

$$5x = 160$$

$$x = 32$$

$$\angle T = 140$$