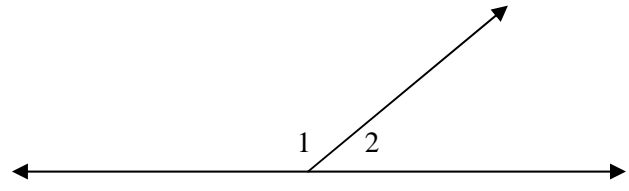


Geometry Honors
Applications of Algebra

Name: _____

- 1) Given: Diagram as shown
 $\angle 1 = x^2 + 4x + 13$
 $\angle 2 = 3x + 47$



Find: $m\angle 1$

$$x^2 + 4x + 13 + 3x + 47 = 180$$

$$x^2 + 7x + 60 = 180$$

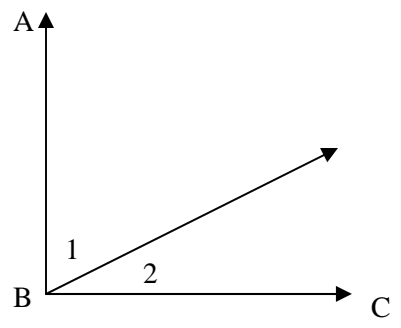
$$x^2 + 7x - 120 = 0$$

$$(x + 15)(x - 8) = 0$$

$$x = -15, 8$$

$$m\angle 1 = 178^\circ, 109^\circ$$

- 2) Given: Diagram as shown
 $\angle ABC$ is a right angle
 $m\angle 1 = 32^\circ 49' 4''$

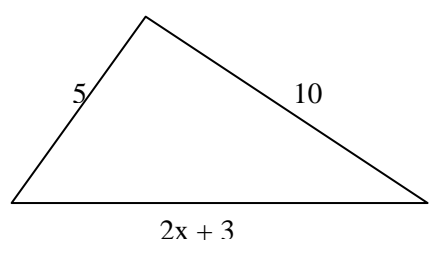


Find: $m\angle 2$

$$\begin{array}{r} 89^\circ 59' 60'' \\ - 32^\circ 49' 4'' \\ \hline 57^\circ 10' 56'' \end{array}$$

$$m\angle 2 = 57^\circ 10' 56''$$

- 3) Find the restrictions on x .

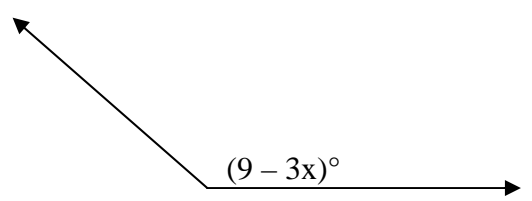


$$5 < 2x + 3 < 15$$

$$2 < 2x < 12$$

$$1 < x < 6$$

- 4) Find the restrictions on x in the obtuse angle below.

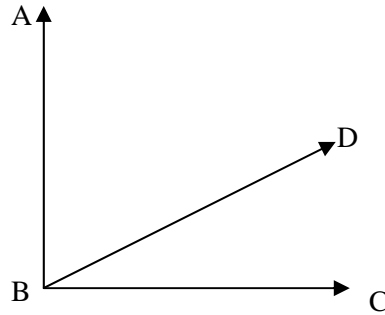


$$90 < 9 - 3x < 180$$

$$81 < -3x < 171$$

$$-27 > x > -57$$

- 5) Given: Diagram as shown
 $\angle ABC$ is a right angle
 $m\angle ABD = (3x^2 - 6x + 43)^\circ$
 $m\angle CBD = (5x + 45)^\circ$



Find: $m\angle ABD$

$$3x^2 - x + 88 = 90$$

$$3x^2 - x - 2 = 0$$

$$(3x+2)(x-1) = 0$$

$$x = -2/3, 1$$

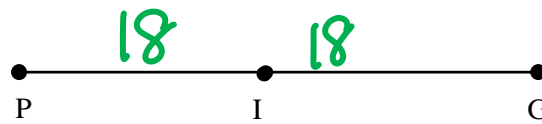
$$m\angle ABD = 40^\circ, 48\frac{1}{3}^\circ$$

- 6) Given: Diagram as shown

$$\overline{PG} = 36$$

$$\overline{PI} = \frac{2}{5}x - 2$$

$$\overline{IG} = \frac{3}{10}x + 3$$



$$\frac{2}{5}x - 2 + \frac{3}{10}x + 3 = 36$$

$$4x - 20 + 3x + 30 = 360$$

$$7x = 350$$

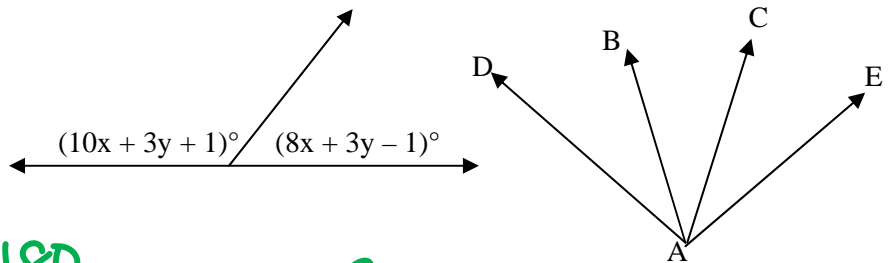
$$x = 50$$

Yes!

Is I a midpoint of \overline{PG} ?

Show work to justify your answer.

- 7) Given: Diagrams as shown
 \overline{AB} and \overline{AC} trisect $\angle DAE$
 $m\angle BAC = (x + 5y + 5)^\circ$
 $m\angle EAC = (3x + y - 1)^\circ$



Find: $m\angle DAC$

$$10x + 3y + 1 + 8x + 3y - 1 = 180$$

$$x + 5y + 5 = 3x + y - 1$$

$$m\angle DAC = 58^\circ$$

$$\Rightarrow \begin{aligned} 18x + 6y &= 180 \\ (2x - 4y = 6) \cdot (-9) & \\ -18x + 36y &= -54 \end{aligned}$$

$$42y = 126$$

$$y = 3$$

$$x = 9$$