

Geo H Unit 1 puzzle Solutions

① Find the length of CD using the distance formula

$$\begin{aligned} CD &= \sqrt{(-6-2)^2 + (12-4)^2} \\ &= \sqrt{(-6+2)^2 + (12-4)^2} \\ &= \sqrt{(-4)^2 + (8)^2} \\ &= \sqrt{16+64} \\ &= \sqrt{80} \\ &= \sqrt{16 \cdot 5} \\ &= \boxed{4\sqrt{5}} \end{aligned}$$

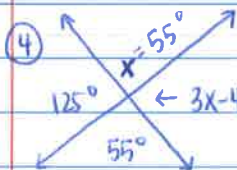
② Find the midpoint using the midpoint formula

$$\begin{aligned} M &= \left(\frac{-6+4}{2}, \frac{8-2}{2} \right) \\ &= \left(\frac{-2}{2}, \frac{6}{2} \right) \\ &= \boxed{(-1, 3)} \end{aligned}$$

③ Using the distance formula, find the distance between $(-6, 8)$ and $(-1, 3)$ OR $(4, -2)$ and $(-1, 3)$

$$\begin{aligned} D &= \sqrt{(-1-6)^2 + (3-8)^2} \\ &= \sqrt{(-1+6)^2 + (3-8)^2} \\ &= \sqrt{(5)^2 + (-5)^2} \\ &= \sqrt{25+25} \\ &= \sqrt{50} \end{aligned}$$

$$\approx 7.07 \times 10 = \boxed{70.7 \text{ ft}}$$



$$x + 3x - 40 = 180$$

$$4x - 40 = 180$$

$$4x = 220$$

$$x = 55$$

$$\text{one angle} = 55^\circ$$

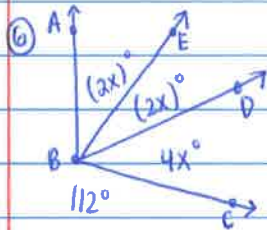
$$\text{other angle} = 3(55) - 40 = 125^\circ$$

$$\boxed{\text{angles} = 55^\circ, 125^\circ, 55^\circ, 125^\circ}$$

⑤ X-values: $6 = \frac{-2+x_2}{2} \Rightarrow 12 = -2+x_2 \Rightarrow x_2 = 14$

y-values: $-1 = \frac{5+y_2}{2} \Rightarrow -2 = 5+y_2 \Rightarrow y_2 = -7$

$(14, -7)$



$$2x + 2x + 4x = 112$$

$$8x = 112$$

$$x = 14$$

$$m\angle EBC = 2x + 4x$$

$$= 6x$$

$$= 6(14)$$

$$= 84^\circ$$

⑦ $5x + 16 = 8x - 23$

$$16 = 3x - 23$$

$$39 = 3x$$

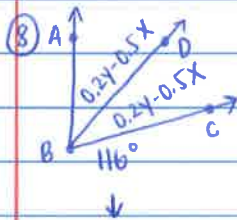
$$x = 13$$

$$m\angle ABC = 5x + 16 + 8x - 23$$

$$= 13x - 7$$

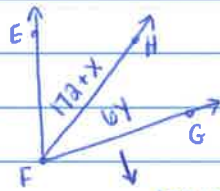
$$= 13(13) - 7$$

$$= 162^\circ$$



$$0.2y - 0.5x + 0.2y - 0.5x = 116$$

$$0.4y - 1x = 116$$



$$17a + x = 6y$$

$$x = 6y - 17a$$

System: $x = 6y - 17a$ } substitute

$$0.4y - x = 116$$

$$0.4y - (6y - 17a) = 116$$

$$0.4y - 6y + 17a = 116$$

$$-5.6y = -5b$$

$$y = 10$$

$$x = 6(10) - 17a$$

$$x = 60 - 17a$$

$$x = -112$$

$$9) x^2 - 6x + 58 + 7x + 32 = 180$$

$$x^2 + x + 90 = 180$$

$$\underline{-180 \quad -180}$$

$$x^2 + x - 90 = 0$$

$$(x+10)(x-9) = 0$$

$$x = \cancel{10}, x = 9$$

check:

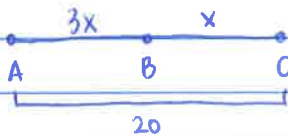
$$x = -10: (-10)^2 - 6(-10) + 58 = 218^\circ$$

↑ doesn't make sense, angle can't be more than 180°

$$x = 9: (9)^2 - 6(9) + 58 = 85$$

$$\boxed{m\angle ABD = 85^\circ}$$

10)



$$3x + x = 20$$

$$4x = 20$$

$$\boxed{x = 5}$$

11) $8x + 38 + 8x - 2 = 180$ (Linear Pair)

$$16x + 36 = 180$$

$$16x = 144$$

$$\boxed{x = 9}$$

$$11y + 4 + 12y + 38 = 180$$

$$23y + 42 = 180$$

$$23y = 138$$

$$\boxed{y = 6}$$

$$m\angle AEB = 8(9) + 38 = 110^\circ$$

$$m\angle CED = 12(6) + 38 = 110^\circ$$

$$m\angle AEC = 11(6) + 4 = 70^\circ$$

$$m\angle BEC = 8(9) - 2 = 70^\circ$$