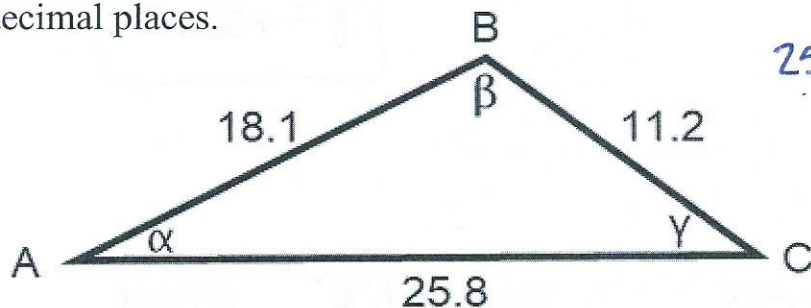


Math 112: #29 A/B/C/D

✓ A) Solve the triangle below; Assume β is obtuse. State your answers for angles to two decimal places.



$$25.8^2 = 18.1^2 + 11.2^2 - 2 \cdot 18.1 \cdot 11.2 \cos \beta$$

$$\frac{25.8^2 - 18.1^2 - 11.2^2}{-2 \cdot 18.1 \cdot 11.2} = \cos \beta$$

$$\cos^{-1} \left(\frac{25.8^2 - 18.1^2 - 11.2^2}{-2 \cdot 18.1 \cdot 11.2} \right) = \beta = 121.62^\circ$$

$$\frac{\sin 121.62^\circ}{25.8} = \frac{\sin \alpha}{11.2}$$

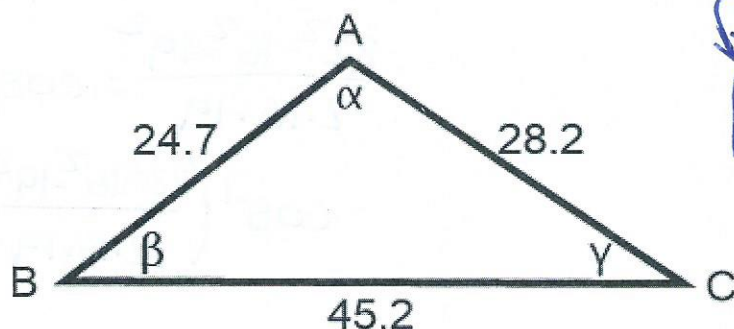
$$\frac{11.2 \sin 121.62^\circ}{25.8} = \frac{25.8 \sin \alpha}{25.8}$$

$$\sin^{-1} \left(\frac{11.2 \sin 121.62^\circ}{25.8} \right) = \alpha = 21.69^\circ$$

$$\gamma = 180^\circ - 21.69^\circ - 121.62^\circ$$

$$\gamma = 36.69^\circ$$

✓ B) Solve the triangle below; Assume α is obtuse. State your answers for angles to two decimal places.



$$\beta = 180^\circ - 117.24^\circ - 29.07^\circ$$

$$\beta = 33.69^\circ$$

$$45.2^2 = 24.7^2 + 28.2^2 - 2 \cdot 24.7 \cdot 28.2 \cos \alpha$$

$$\frac{45.2^2 - 24.7^2 - 28.2^2}{-2 \cdot 24.7 \cdot 28.2} = \cos \alpha$$

$$\cos^{-1} \left(\frac{45.2^2 - 24.7^2 - 28.2^2}{-2 \cdot 24.7 \cdot 28.2} \right) = \alpha = 117.24^\circ$$

$$\frac{\sin 117.24^\circ}{45.2} = \frac{\sin \gamma}{24.7}$$

$$\frac{24.7 \sin 117.24^\circ}{45.2} = \frac{45.2 \sin \gamma}{45.2}$$

$$\sin^{-1} \left(\frac{24.7 \sin 117.24^\circ}{45.2} \right) = \gamma = 29.07^\circ$$