CMGT 350 QUIZ #1 Fall 2022

NAME: Solution

1. Solve the given equation for the unknown variable.

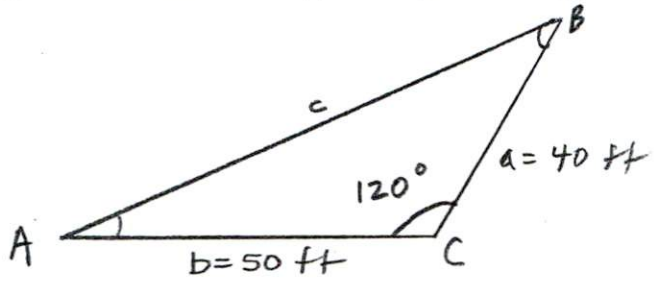
$$\frac{\sin A}{15} = \frac{\sin 30^\circ}{45}$$

$$\sin A = \frac{\sin 30^\circ (15)}{45}$$

$$A = \sin^{-1} 0.166667$$

$$= 9.6^\circ$$

2. Determine the length of the unknown side (c) and Angle A and angle B for the oblique triangle.



SAS Law of Cosines

$$c = \sqrt{50\text{ft}^2 + 40\text{ft}^2 - 2(50\text{ft})(40\text{ft})\cos 120^\circ}$$

$$= \sqrt{4100\text{ ft}^2 - -2000\text{ ft}^2}$$

$$= 78\text{ ft}$$

Law of Sines

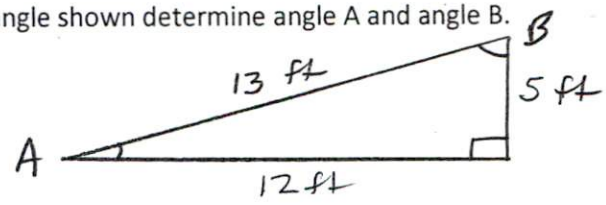
$$\frac{\sin A}{40\text{ft}} = \frac{\sin 120^\circ}{78\text{ ft}}$$

$$A = \sin^{-1}\left(\frac{40\text{ ft}\sin 120^\circ}{78\text{ ft}}\right) = \sin^{-1}(0.444115592)$$

$$= 26^\circ$$

$$B = 180^\circ - 120^\circ - 26^\circ = 34^\circ$$

3. For the right triangle shown determine angle A and angle B.



$\tan A = \frac{5\text{ ft}}{12\text{ ft}}$

$A = \tan^{-1}\left(\frac{5\text{ ft}}{12\text{ ft}}\right) = 23°$

$B = 90° - 23° = 67°$

4. Solve the system of linear equations shown using the Method of Elimination by Substitution, The Method of Elimination by Addition or Subtraction, or Cramer's Rule.

$-5x + y = -3 \quad (1)$

$3x - 8y = 24 \quad (2)$

multiply (1) × 8

$-40x + 8y = -24$

ADD

$+ \quad 3x - 8y = 24$

$-37x = 0$

$x = 0$

subst into (1)

$-5(0) + y = -3$

$y = -3$

Check

$-5(0) + -3 = -3$

$-3 = -3$ ✓

Substitution

$$-5x + y = -3 \quad (1)$$
$$3x - 8y = 24 \quad (2)$$

Solve (1) for y $\quad y = -3 + 5x \quad (3)$

Subst (3) into (2)

$$3x - 8(-3 + 5x) = 24$$
$$3x + 24 - 40x = 24$$
$$-37x = 0$$
$$x = 0$$

Subst into (3)

$$y = -3 + 5(0) = -3$$

Check

$$-5(0) + -3 = -3$$
$$-3 = -3 \checkmark$$