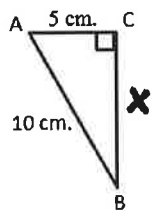Show all work to receive credit and read your directions carefully. Round to the nearest. We are moving onto applications tomorrow and you need to know these skills to be successful! ☺

1. Find the missing side or sides of each triangle. Anything you need to find has a variable!
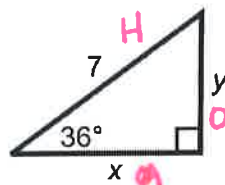
$5^2 + x^2 = 10^2$
$25 + x^2 = 100$
$x^2 = 75$
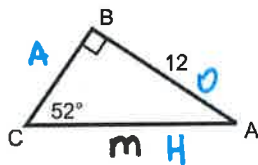$\boxed{x \approx 8.7 \text{cm}}$

$\cos(36) = \frac{x}{7}$
$x = 7\cos(36)$
$\boxed{x \approx 5.7 \text{ units}}$
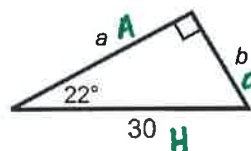
$\sin(36) = \frac{y}{7}$
$y = 7\sin(36)$
$\boxed{y \approx 4.1 \text{ units}}$

$\cos(22) = \frac{a}{30}$
$a = 30\cos(22)$
$\boxed{a \approx 27.8 \text{units}}$

$\sin(52) = \frac{12}{m}$
$m \cdot \sin(52) = 12$
$m = \frac{12}{\sin(52)} \approx \boxed{15.2 \text{ units}}$

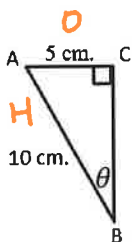$\sin(22) = \frac{b}{30}$
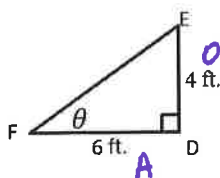$b = 30\sin(22)$
$\boxed{b \approx 11.2 \text{ units}}$

2. Find the missing angle of each triangle.

$\sin(\theta) = \frac{5}{10}$
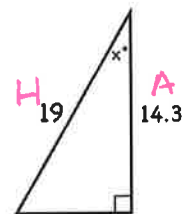$\theta = \sin^{-1}\left(\frac{5}{10}\right)$
$\boxed{\theta = 30°}$

$\tan(\theta) = \frac{4}{6}$
$\theta = \tan^{-1}\left(\frac{4}{6}\right)$
$\boxed{\theta \approx 33.7°}$
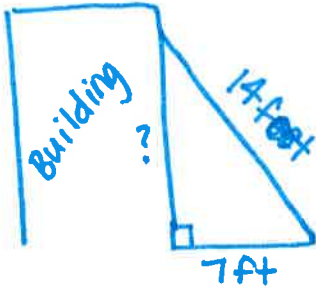
$\cos(x) = \frac{14.3}{19}$
$x = \cos^{-1}\left(\frac{14.3}{19}\right)$
$\boxed{x \approx 41.2°}$

3. There is a 14-foot ladder leaning against the side of a building. If the bottom of the ladder is 7 feet from the base of the building, then determine how high up the side of the building the ladder is resting.

$$7^2 + b^2 = 14^2$$
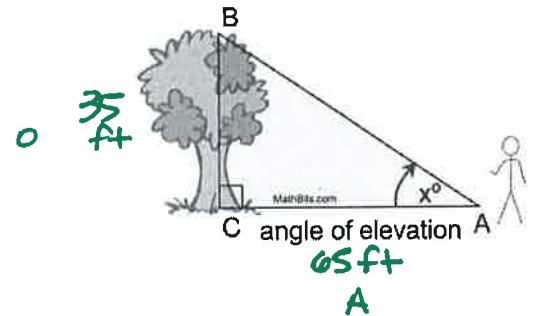$$49 + b^2 = 196$$
$$b^2 = 147$$
$$b \approx \boxed{12.1 \text{ feet}}$$

4. Determine the value of angle x if the man is standing 65 feet away from the base of the tree and the tree is 35 feet tall. (Use the picture to help you!)

$$\tan(x) = \frac{35}{65}$$

$$x = \tan^{-1}\left(\frac{35}{65}\right)$$

$$x \approx \boxed{28.3°}$$

C angle of elevation A
65 ft
A

5. Identify each of the following by their sides (scalene, isosceles, or equilateral) and angles (right, acute, or obtuse). Don't forget to show your work for these!

a. Sides: 7.3 m, 12.1 m, 7.3 m

$$12.1^2 \ \square \ 7.3^2 + 7.3^2$$
$$146.41 \ \boxed{>} \ 106.58$$

Obtuse + isosceles

b. Sides: 5 in, 5 in, 5 in

$$5^2 \ \square \ 5^2 + 5^2$$
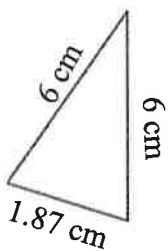$$25 \ \boxed{<} \ 50$$

Acute + Equilateral

c. Sides: 30 ft, 40 ft, 50 ft

$$50^2 \ \square \ 30^2 + 40^2$$
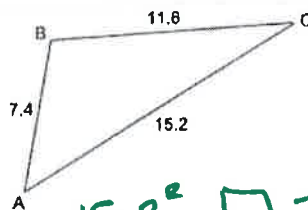$$2500 \ \boxed{=} \ 2500$$

Right + Scalene

d.

$$6^2 \ \square \ 6^2 + 1.87^2$$
$$36 \ \boxed{<} \ 39.4969$$

Acute + Isosceles

e.

$$15.2^2 \ \square \ 7.4^2 + 11.6^2$$
$$231.04 \ \boxed{>} \ 189.32$$

Obtuse + scalene

f.
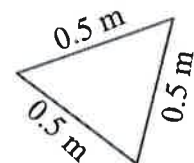
$$.5^2 \ \square \ .5^2 + .5^2$$
$$.25 \ \boxed{<} \ .5$$

Acute + Equilateral