Name: **Key**

$\sin x = -\frac{1}{2}$

1. If $0° \le x \le 360°$, solve: $\csc x = -2$.

$X = \boxed{210°, 330°}$

2. Assuming an angle in Quadrant I, evaluate $\tan\left(\sec^{-1}\frac{13}{5}\right)$.

$\tan\left(\sec^{-1}\frac{13}{5}\right) = \boxed{\frac{12}{5}}$

3. Given right triangle ABC, find B to the nearest tenth of a degree if $b = 7$ and $c = 12$.
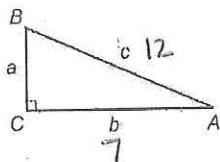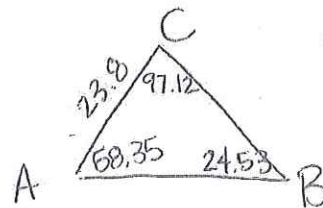
$\sin B = \frac{7}{12}$

$B = \boxed{35.7°}$

Find each value. Round to the nearest tenth.

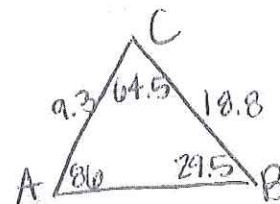4. In $\triangle ABC$, $A = 58° \, 21'$, $C = 97° \, 07'$, and $b = 23.8$. Find a.

58.35   97.12

$\boxed{a \approx 48.8}$

$\dfrac{\sin 24.53}{23.8} = \dfrac{\sin 58.35}{a}$

5. If $B = 29.5°$, $C = 64.5°$, and $a = 18.8$, find the area of $\triangle ABC$.

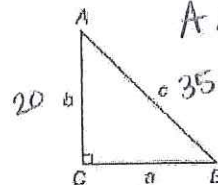$\frac{1}{2}(9.3)(18.8)\sin 64.5 \approx \boxed{78.7 \text{ un}^2}$

$\dfrac{\sin 86}{18.8} = \dfrac{\sin 29.5}{b}$

$9.3 \approx b$

6. Solve $\triangle ABC$ given that $b = 20$ and $c = 35$.

$\sin B = \frac{20}{35}$

$B = \sin^{-1}\frac{20}{35}$

$\boxed{A = 55.2°}$

$\boxed{B = 34.8°}$

$20^2 + a^2 = 35^2$

$\boxed{a \approx 28.7}$

Refer to the figure. Find each value to the nearest tenth.

7. Find a. $\approx \boxed{6.6}$

8. Find c. $\approx \boxed{9.8}$
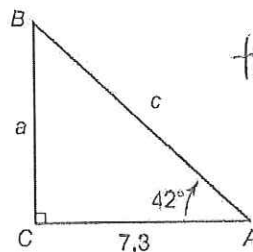
$\tan 42 = \dfrac{a}{7.3}$

$\cos 42 = \dfrac{7.3}{c}$

A 100-foot cable is stretched from a stake in the ground to the top of a pole. The angle of elevation is $57°$.
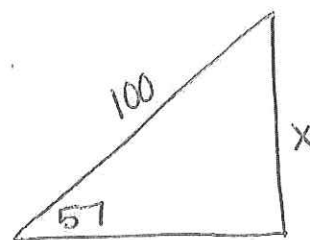
9. Find the height of the pole to the nearest tenth.

10. Find the distance from the base of the pole to the stake to the nearest tenth.
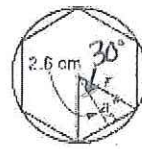
$\sin 57 = \dfrac{x}{100}$ $\cos 57 = \dfrac{y}{100}$

#9 $\boxed{83.9 \text{ ft}}$ #10 $\boxed{54.5 \text{ ft}}$

11. *Geometry* The apothem of a regular polygon is the measure of a line segment from the center of the polygon to the midpoint of one of its sides. The apothem of a regular hexagon is 2.6 centimeters. Find the radius of the circle circumscribed about the hexagon to the nearest tenth.
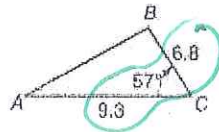
$$360/6 = 60/2 = 30$$

$$\cos 30 = \frac{2.6}{r}$$

$$\boxed{3.0^{cm} \approx r}$$

12. Solve $\tan x = -\frac{\sqrt{3}}{3}$, if $0° \leq x \leq 360°$. $330°, 150°$

**13.** Solve $\cot x =$ undefined, if $0° \leq x \leq 360°$. $0°, 180°, 360°$

14. Find the area of $\triangle ABC$ if $a = 6.8$, $b = 9.3$, and $C = 57°$.

$$\frac{1}{2}(6.8)(9.3)\sin 57$$

$$\boxed{26.5 \ un^2}$$

15. Two people are walking toward each other on a path through the park. The path runs east and West. A sky lantern is directly above the path between them. One of the walkers, a female, sees the balloon when looking east at an angle of elevation of 46°. The other walker, a male, sees the balloon looking west at an angle of elevation of 72°. If the walkers are 55 yards apart, how far is the balloon from the male observer?
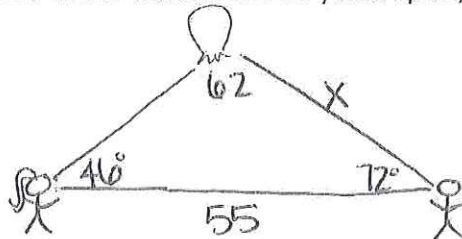
$$\frac{\sin 62}{55} = \frac{\sin 46}{x}$$

$$\boxed{44.8 \ ft}$$

16. A ladder is in an unsafe position if it makes an angle of less than 15 degrees with a wall. A 10 meter ladder is placed so that its foot is 3 meters from the wall. Is the ladder standing safely?
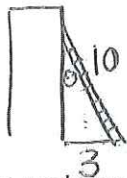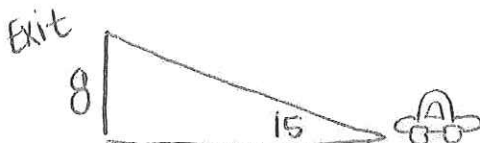
$$\sin \theta = \frac{3}{10}$$

$$\theta \approx 17.5°$$

Yes, It makes an $\angle$ greater than 15° with the wall.

17. An underground parking lot is being constructed 8 meters below ground level. If the exit ramp is to rise at a 15 degree angle, how long will the ramp be? What horizontal distance is needed for the ramp?
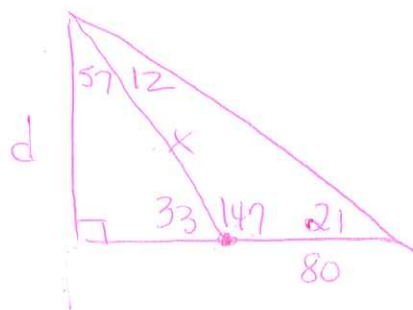
Exit

$$\sin 15 = \frac{8}{x}$$

$$\boxed{long: 30.9 \ meters}$$

$$\tan 15 = \frac{8}{y}$$

$$\boxed{H \ dist: 29.9 \ meters}$$

Trig/PreCalc   Law of Sines Practice   Name ___Key___

1. The **angle of elevation** to the top of a building is 21°. At a **point** 80 feet closer, the **angle of elevation** to the top of the same building is 33°. Approximate the **height** of the building.

$$\frac{\sin 12}{80} = \frac{\sin 21}{x}$$

$$x = \frac{80 \sin 21}{\sin 12} = 137.9$$

$$\sin 33 = \frac{d}{137.9}$$

height ≈ 75.1 feet

2. Two people are walking toward each other on a path through the park. The path runs east and west. A hot air balloon is directly above the path between them. One of the walkers, a female, sees the balloon when looking east at an **angle of elevation** of 46°. The other walker, a male, sees the balloon looking west at an **angle of elevation** of 72°. If the walkers are 55 yards apart, how far is the balloon from the male observer?

See 5.4-5.6 Quiz Review Ans key
#15

3. A building is of unknown height. At a distance of 100 feet away from the building, an observer notices that the angle of elevation to the top of the building is 41º and that the angle of elevation to a poster on the side of the building is 21º. How far is the poster from the roof of the building?
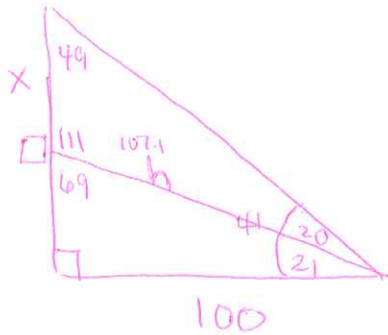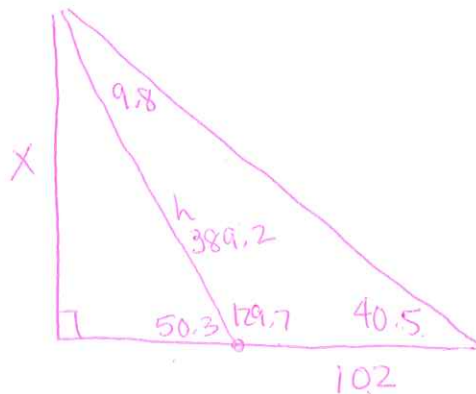
$$\cos 21 = \frac{100}{h}$$

$$h = 107.1$$

$$\frac{\sin 49}{107.1} = \frac{\sin 20}{x}$$

$$x = 48.5 \text{ feet}$$

4. Bill determines that the angle of elevation to the top of a building measures 40°30'. If he walks 102 ft closer to the building, the measure of the new angle of elevation will be 50°20'. Find the height of the building.

40.5°

50.3°

$$\frac{\sin 9.8}{102} = \frac{\sin 40.5}{h}$$

$$h =$$

$$\sin 50.3 = \frac{x}{389.2}$$

$$x = 299.5 \text{ feet}$$