1a. Find the sine, cosine, and tangent of the given angles.

$\cos H =$ 5/13

$\tan S =$ 5/12

$\sin H =$ 12/13

b. Find the sine, cosine, and tangent of the given angles.

$\cos A =$ y/z

$\tan B =$ y/x

$\sin A =$ x/z

2a. Solve for the measure of the given angle.

a. $\cos A = \dfrac{6}{7}$

$\angle A = 31.003°$

b. $\tan K = 1$

$\angle K = 45°$

c. $\sin R = \dfrac{-1}{2}$

$\angle R = -30°$

b. Solve for the measure of the given angle.

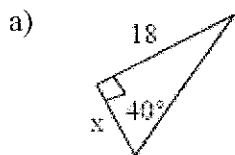a. $\cos^{-1}\left(\dfrac{3}{12}\right) = Q$

$\angle Q = 75.522°$

b. $\tan^{-1}\left(\dfrac{7}{3}\right) = T$

$\angle T = 66.801°$

c. $\sin^{-1}\left(\dfrac{8}{9}\right) = Z$

$\angle Z = 62.734°$

3. Find the length of the missing side or measure of the missing angle showing all steps.

a)

$\tan 40 = \dfrac{18}{x}$

$x = \dfrac{18}{\tan 40}$

$x = 21.452$

b)

$\cos 49 = \dfrac{75}{x}$

$x = \dfrac{75}{\cos 49}$

$x = 114.319$

c)
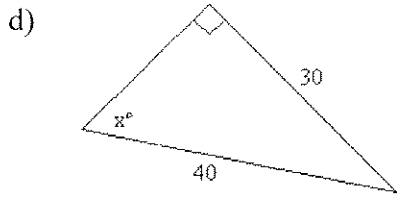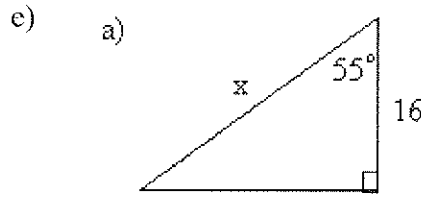

$\sin 36 = \dfrac{x}{10}$

$x = 10 \cdot \sin 36$

$x = 5.878$

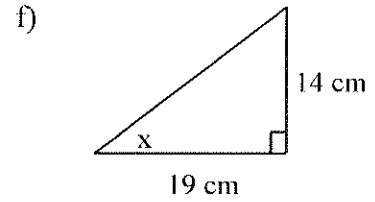3. Find the length of the missing side or measure of the missing angle showing all steps.
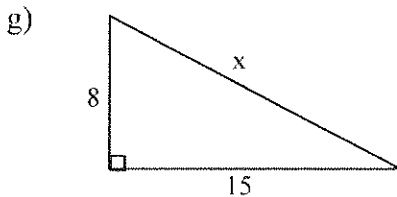
d)

$$\sin x = \frac{30}{40}$$

$$x = 48.590°$$

e) a)

$$\overset{cos}{\cancel{tan}} 55 = \frac{16}{x}$$
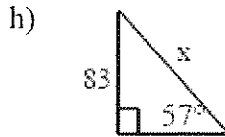
$$x = 27.895$$

f)

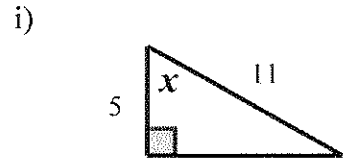$$\tan x = \frac{14}{19}$$

$$x = 36.384$$

g)

$$8^2 + 15^2 = x^2$$
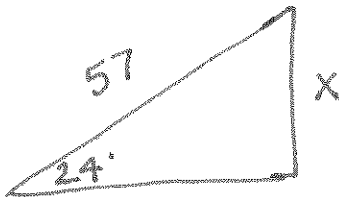
$$17 = x$$

h)

$$\sin 57 = \frac{83}{x}$$

$$x = 98.966$$

i)

$$\cos x = \frac{5}{11}$$

$$x = 62.964$$

4. Juan climbed a hill that was at a 24° angle with the ground. When he reached the top he a direct distance of 57 feet from where he started. What was his altitude above the ground?

$$\sin 24 = \frac{x}{57}$$

$$x = 23.184 \text{ feet}$$

5. To land, an airplane will approach an airport at a 4° angle of depression. If the plane is flying at 20,000 ft, find the ground distance from the airport to the point directly below the plane when the pilot begins descending.
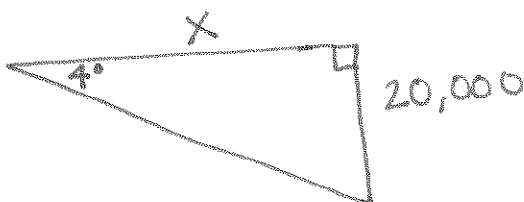
$$\tan 4 = \frac{20,000}{x}$$

$$x = 286013.325 \text{ ft}$$

6. A mountain climber, standing at the base of a mountain, estimates the angle of elevation to the top of the mountain as 48°. The mountain is 2500 feet tall. What is the straight line distance from the mountain climber to the top of the mountain?
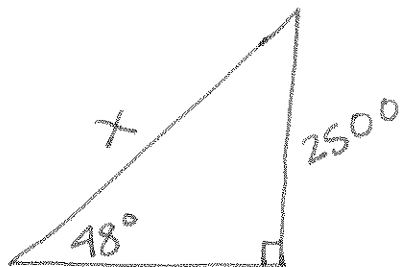
$$\sin 48 = \frac{2500}{x}$$

$$x = 3364.082 \text{ feet}$$

7. At what height will a ladder rest against a building if it is 14 feet long and the base is placed at angle at 65° with the ground. Draw a diagram and show all work to solve.
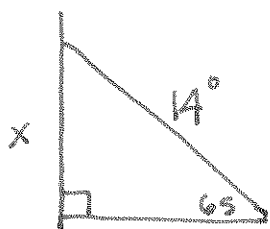
$$\sin 65 = \frac{x}{14}$$

$$x = 12.688 \text{ feet}$$

8. A wire anchored to the ground braces a pole. The wire is 20 feet long and is attached to the pole 15 feet from the base of the pole. What angle does the wire make with the ground? Draw a diagram and show all work to solve.
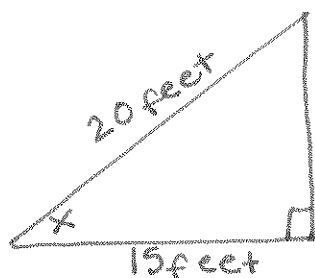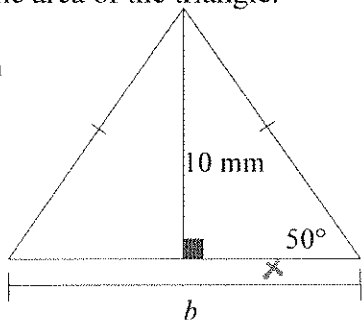
$$\cos x = \frac{15}{20}$$

$$x = 41.41°$$

9. Find the area of the triangle.

$h = 10$ mm
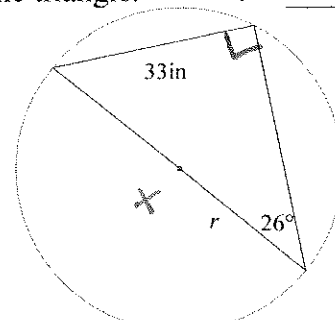
10 mm

50°

b

$A \approx$ _____

$$\tan 50 = \frac{10}{x}$$

$$x = 8.391 \text{ mm} \cdot 2 = b = 16.782$$

$$A = \frac{1}{2}(16.782)(10) = 83.91 \text{ mm}^2$$

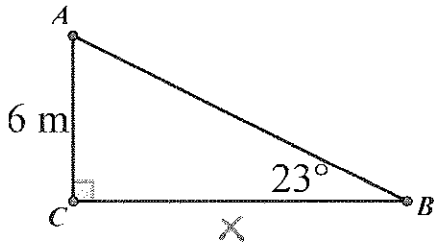10. Find the radius of the triangle. $r \approx$ _____

33in

x

r 26°

$$\sin 26 = \frac{33}{x}$$

$$x = 75.279.$$

$$\frac{x}{2} = r = 37.639 \text{ in}$$

11. Find the area of the triangle. $A \approx$ _____
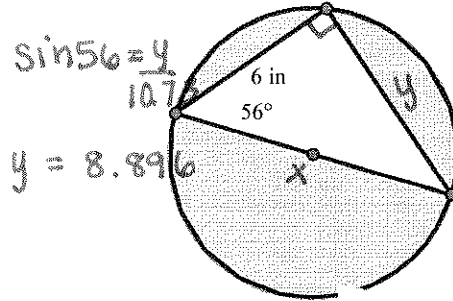

$$\tan 23 = \frac{16}{x}$$

$$x = 37.694$$

$$A = \frac{1}{2}(16)(37.694) = \boxed{301.552 m^2}$$

12. Find the area of the shaded region. $A \approx$ _____

$$\sin 56 = \frac{y}{10.7}$$

$$y = 8.896$$

$$\cos 56 = \frac{6}{x}$$
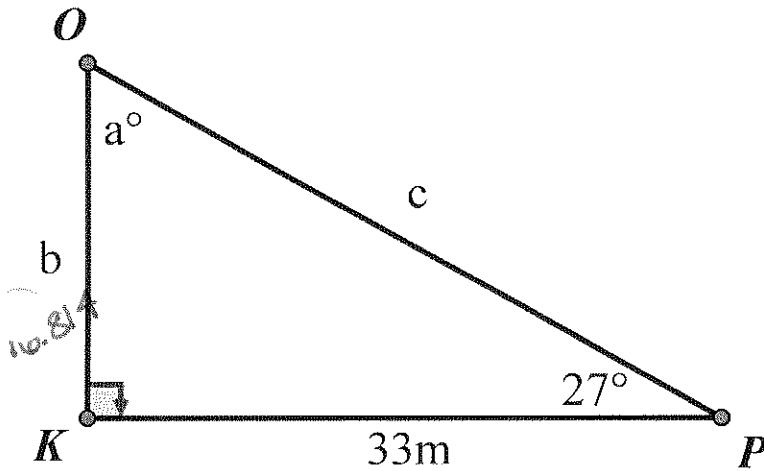
$$x = 10.73$$

$$r = 5.365$$

$$A = (\pi 5.365^2) - (\frac{1}{2} \cdot 6 \cdot 8.896)$$

$$A = \boxed{63.691 in^2}$$

13. Find a, b, and c.

$$\tan 27 = \frac{b}{33}$$

$$\boxed{16.814 m = b}$$
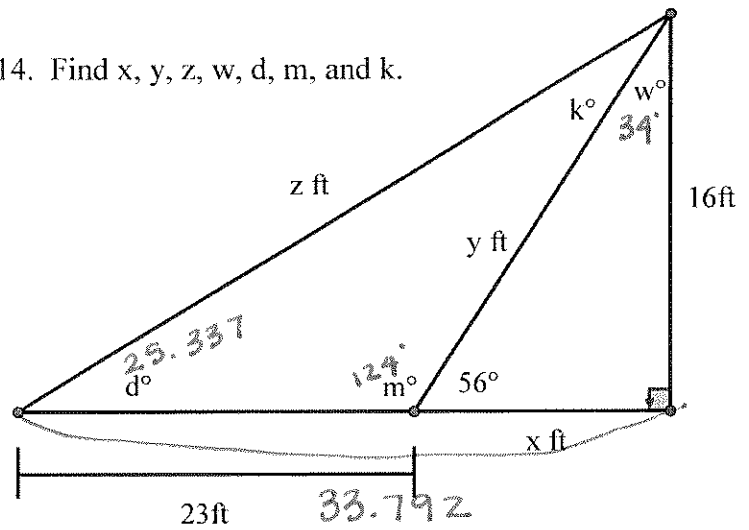
$$\cos 27 = \frac{33}{c}$$

$$\boxed{37.037 m = c}$$

$$\tan a = \frac{33}{16.814}$$

$$\boxed{a = 63°}$$

14. Find x, y, z, w, d, m, and k.

$$\boxed{w = 34°}$$

$$\boxed{m = 124°}$$

$$\tan d = \frac{16}{33.792}$$

$$\boxed{d = 25.337°}$$

$$\boxed{k = 30.663°}$$

$$\tan 56 = \frac{16}{x}$$

$$\boxed{x = 10.792 ft}$$

$$\sin 56 = \frac{16}{y}$$

$$\boxed{y = 19.3 ft}$$

$$\sin 25.337 = \frac{16}{z}$$

$$\boxed{z = 37.388 ft}$$

. What are the definitions for tangent, sine, and cosine?

SOH · CAH · TOA !

$$\sin x = \frac{o}{h}$$

$$\cos x = \frac{a}{h}$$

$$\tan x = \frac{o}{a}$$