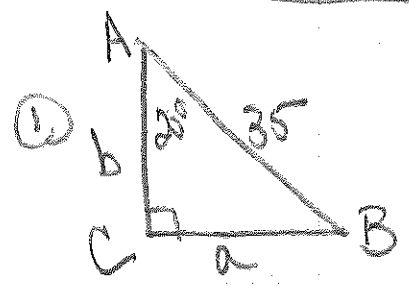
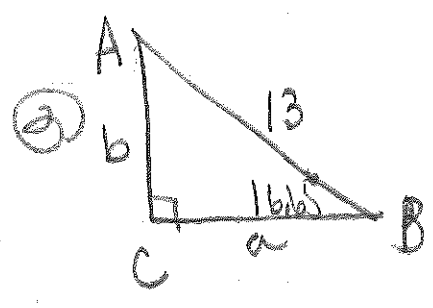


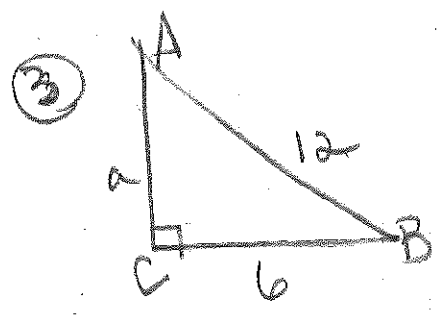
Lesson #6 PW #2



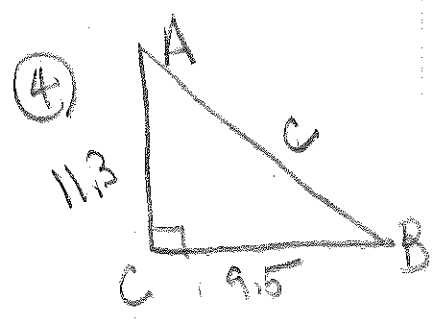
$\angle A = 20^\circ$ $a = 12.0$
 $\angle B = 70^\circ$ $b = 32.9$
 $\angle C = 90^\circ$ $c = 35$



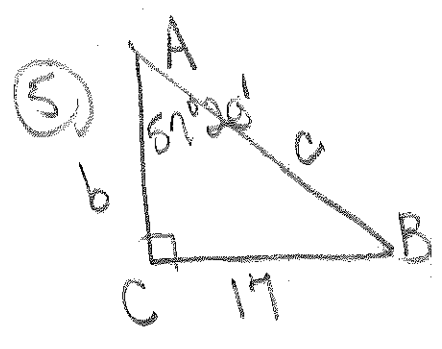
$\angle A = 73.35^\circ$ $a = 12.5$
 $\angle B = 16.65^\circ$ $b = 3.92$
 $\angle C = 90^\circ$ $c = 13$



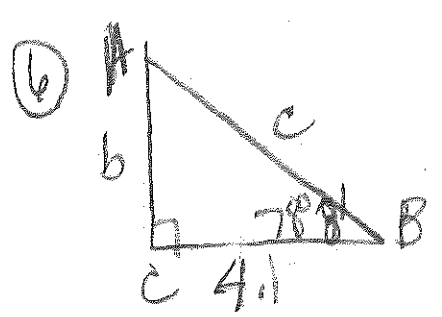
$\angle A = 30^\circ$ $a = 6$
 $\angle B = 60^\circ$ $b = 10.4$
 $\angle C = 90^\circ$ $c = 12$



$\angle A = 40.1^\circ$ $a = 9.5$
 $\angle B = 49.9^\circ$ $b = 11.3$
 $\angle C = 90^\circ$ $c = 14.7$



$\angle A = 57^\circ 20'$ $a = 17$
 $\angle B = 32^\circ 40'$ $b = 10.9$
 $\angle C = 90^\circ$ $c = 20.2$



$\angle A = 11^\circ 52'$ $a = 4.1$
 $\angle B = 78^\circ 8'$ $b = 19.5$
 $\angle C = 90^\circ$ $c = 19.9$

MA3A2. Students will use ratios to define the trigonometric functions.

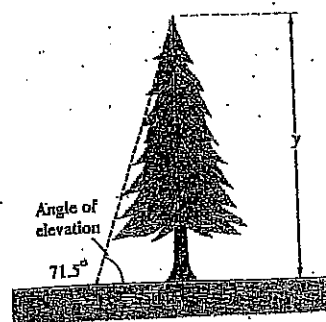
7

A surveyor is standing 50 ft from the base of a large tree. The surveyor measures the angle of elevation to the top of the tree as 71.5° . How tall is the tree?

$$\tan 71.5^\circ = \frac{y}{50}$$

$$50 (\tan 71.5^\circ) = y$$

$$\boxed{149.43' = y}$$



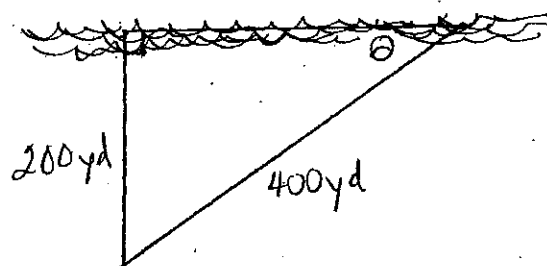
8

A person is standing 200 yards from a river. Rather than walk directly to the river, the person walks 400 yards along a straight path to the river's edge. Find the acute angle θ between this path and the river's edge.

$$\sin \theta = \frac{200}{400}$$

$$\sin^{-1}\left(\frac{200}{400}\right) = \theta$$

$$\boxed{30^\circ = \theta}$$



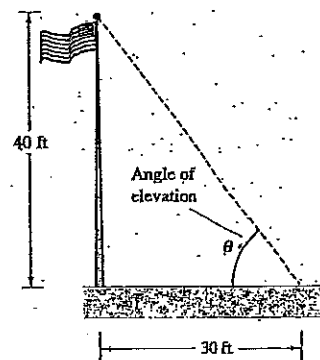
9

A 40-ft flagpole casts a 30-ft shadow. Find θ , the angle of elevation of the sun.

$$\tan \theta = \frac{40}{30}$$

$$\tan^{-1}\left(\frac{40}{30}\right) = \theta$$

$$\boxed{53.13^\circ = \theta}$$



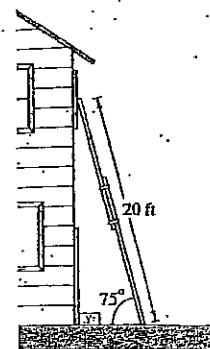
10

A 20-ft ladder leaning against the side of a house makes a 75° angle the ground. How far up the side of the house does the ladder reach?

$$\sin 75^\circ = \frac{x}{20}$$

$$20 \sin 75^\circ = x$$

$$\boxed{19.32' = x}$$



11

From a 150-foot observation tower on the coast, a Coast Guard sights a boat in difficulty. The angle of depression of the boat is 4° . How far is the boat from the shoreline?

$$\tan 4^\circ = \frac{150}{x}$$

$$x \tan 4^\circ = 150$$

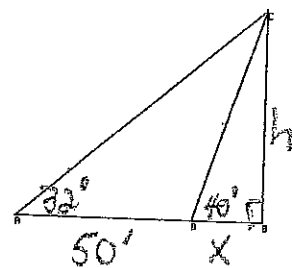
$$\boxed{x = 2145.1'}$$



12 To measure the height of a building, two sightings are taken at a distance of 50 feet apart. If the first angle of elevation is 40° and the second is 32° , what is the height of the building?

$$\tan 40^\circ = \frac{h}{x} \quad \tan 32^\circ = \frac{h}{50+x}$$

$$x \tan 40^\circ = h$$



substitution: $\tan 32^\circ = \frac{x \tan 40^\circ}{50+x}$

ref: x

$$(50+x) \tan 32^\circ = x \tan 40^\circ$$

$$31.2434 + x \tan 32^\circ = x \tan 40^\circ$$

$$31.2434 + .6249x = .8391x$$

$$31.2434 = .2142x$$

substituted to solve for h:

$$x = 145.8209$$

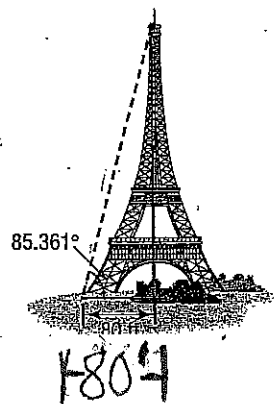
$$\tan 40^\circ = \frac{h}{145.8209}$$

$h = 122.4'$

13 The tallest tower built before the era of television masts, the Eiffel Tower was completed on March 31, 1889. Find the height of the Eiffel Tower (before a television mast was added to the top) using the information in the illustration.

$$\tan 85.361^\circ = \frac{x}{80'}$$

$x = 985.9'$

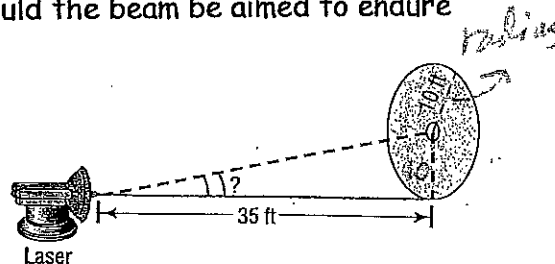


14 A laser beam is directed through a small hole in the center of a circle of radius 10 feet. The origin of the beam is 35 feet from the circle. At what angle of elevation should the beam be aimed to ensure that it goes through the hole?

$$\tan \theta = \frac{10}{35}$$

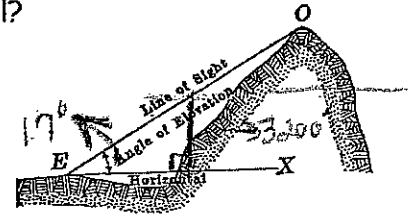
$$\tan^{-1}\left(\frac{10}{35}\right) = \theta$$

$\theta = 15.9^\circ$



15. A straight trail with uniform inclination of 17° leads from a hotel at an elevation of 9,000 feet to a mountain lake at an elevation of 11,200 feet. What is the length of the trail?

$$\sin 17^\circ = \frac{2200}{x}$$
$$x = 7525'$$



16. A radio transmission tower is 200 feet high. How long should a guy wire be if it is to be attached to the tower 10 feet from the top and makes angle of 21° with the ground?

$$\sin 21^\circ = \frac{190}{x}$$
$$x = 530'$$

