Worksheet Answers

1) 64 ft

2) 33.76 m

3) 373 ft

4) 725.6 ft
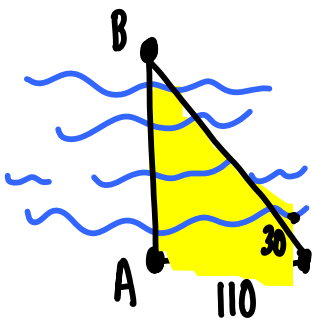
5) 9.34 ft

6) 15.5 mi

7) 191 Km

8) 5.07 mi

9) 75.1 ft

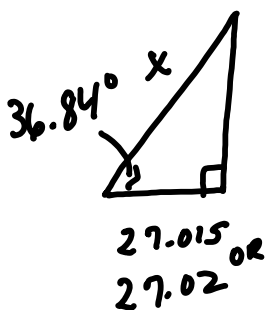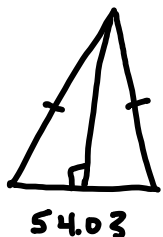# CAT Application Problems (Trig Lessons 2.4 and 2.5)   Name: __Key__

1. A conservation officer needs to know the width of a river in order to set instruments correctly for a study of pollutants in the river. From point A, the officer walks 110 ft downstream and sights point B on the opposite bank to determine that Θ = 30˚. How wide is the river?

$$\tan 30 = \frac{x}{110}$$

$$\boxed{x = 64 \text{ ft}}$$

*[Diagram: river with points B and A, triangle, angle 30°, base 110]*

2. The length of the base of an isosceles triangle is 54.03 meters. Each base angle is 36.84˚. Find the length of each of the 2 equal sides of the triangle.

[Diagram: isosceles triangle with base 54.03, angle 36.84°, x, 27.015 or 27.02]

$$\cos 36.84° = \frac{27.015}{x}$$

$$\boxed{x = 33.76 \text{ m}}$$

3. From a boat on a lake, the angle of elevation to the top of a cliff is 29˚38'. If the base of the cliff is 655 ft from the boat, how high is the cliff?

*[Diagram: boat, angle 29°38', base 655, height x]*
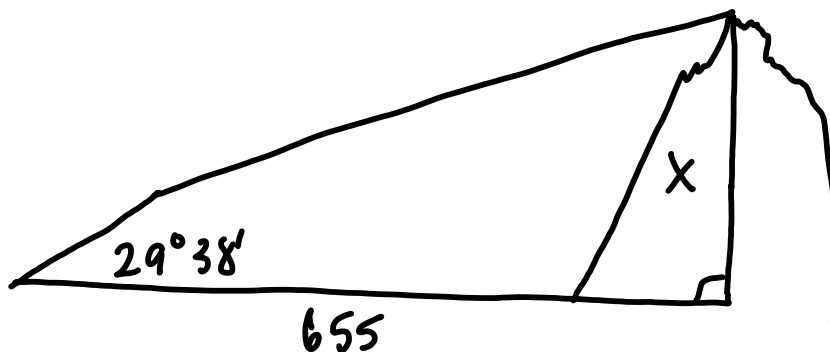
$$\tan 29°38' = \frac{x}{655}$$

$$\boxed{x = 373 \text{ ft}}$$

CAT Application Problems (Trig Lessons 2.4 and 2.5)   Name:_____

4. A person is watching a boat from the top of a lighthouse. The boat is approaching the lighthouse directly. When 1st noticed, the angle of depression to the boat is 12°38'. When the boat stops the angle of depression is 50°11'. The lighthouse is 200 ft tall. How far did the boat travel from when it was 1st noticed until it stopped?
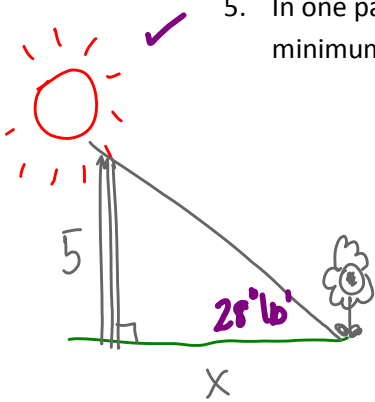
200.0ft
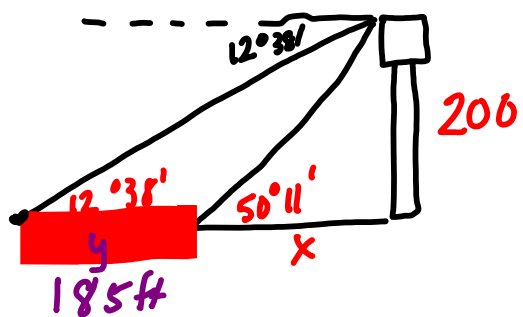
$$\tan 50°11' = \frac{200}{x}$$

$$x = 166.7 ft$$

$$\tan 12°38' = \frac{200}{y + 166.7}$$

$$y = \frac{200}{\tan 12°38'} - 166.7 \qquad \boxed{725.6 ft}$$

200

185ft

5. In one part of the country, the lowest angle of elevation of the sun in winter is 28°10'. Find the minimum distance x that a plant needing full sun can be placed from a fence that is 5 feet high.

5.00

$$\tan 28°10' = \frac{5}{x}$$

$$\boxed{9.34 ft = x}$$

5

28°10'

X

6. A fire is sighted due west of lookout A. The bearing of the fire from lookout B, which is 12.6 miles due south of A, is N 35°57' W. How far is the fire from B?

50'

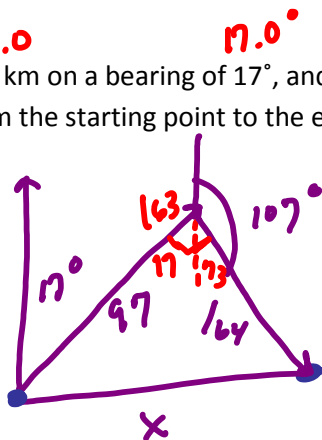$$\cos 35°50' = \frac{12.6}{x}$$

$$\boxed{15.5 mi = x}$$

A

35°50'   12.6

X

B
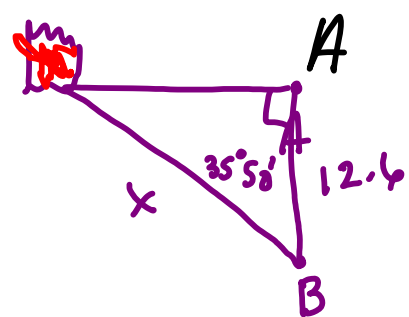
# CAT Application Problems (Trig Lessons 2.4 and 2.5) Name:_____

✓

7. A ship travels 97 km on a bearing of 17°, and then travels on a bearing of 107° for 164 km. Find the distance from the starting point to the end of the trip.

97.0   17.0°

163   107°
17 73
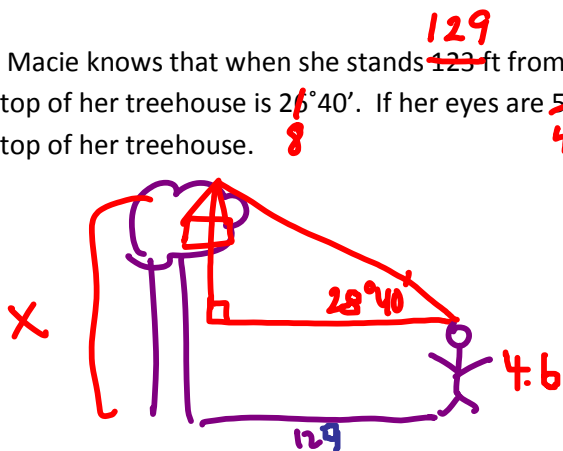17°
97   164
x

$97^2 + 164^2 = x^2$

$191 \ km = x$

.

8. Radio direction finders are set up at points A and B, 8.68 miles apart on an east-west line. From A, it is found that the bearing of a signal from a transmitter is N 54.3° E, while from B, it is N 35.7° W. Find the distance of the transmitter form B.

T
54.3°   x   357
35.7   54.3
A   8.68mi   B
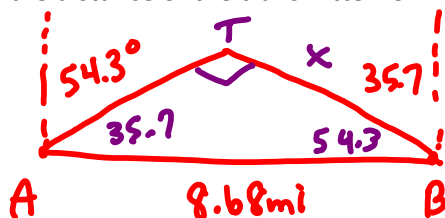
$\cos 54.3° = \dfrac{x}{8.68}$

$5.07 \ mi = x$

9. Macie knows that when she stands 123 ft from the base of a tree, the angle of elevation to the top of her treehouse is 26°40′. If her eyes are 5.30 ft above the ground, find the height to the top of her treehouse.

129   8   4.60

✓

x
28°40′
4.6
129

$\tan 28°40' = \dfrac{x}{129}$

$70.5 \ ft = x$
$+ 4.6$

$75.1 \ ft$