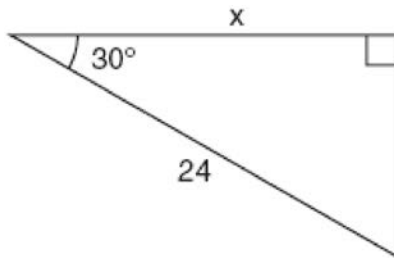


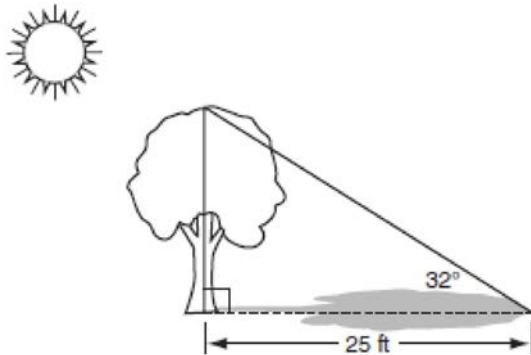
**A.A.44: Using Trigonometry to Find a Side 1: Find the measure of a side of a right triangle, given an acute angle and the length of another side**

- 1 In the right triangle shown in the diagram below, what is the value of  $x$  to the *nearest whole number*?



- 1) 12
- 2) 14
- 3) 21
- 4) 28

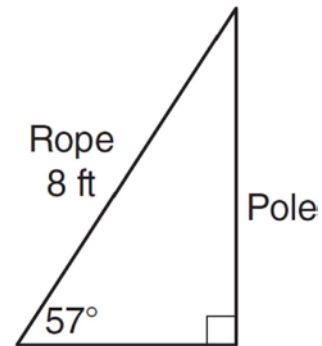
- 2 A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.



If the angle of elevation from the tip of the shadow to the top of the tree is  $32^\circ$ , what is the height of the tree to the *nearest tenth of a foot*?

- 1) 13.2
- 2) 15.6
- 3) 21.2
- 4) 40.0

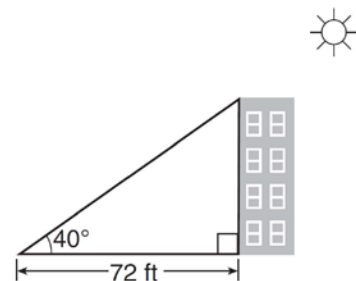
- 3 An 8-foot rope is tied from the top of a pole to a stake in the ground, as shown in the diagram below.



If the rope forms a  $57^\circ$  angle with the ground, what is the height of the pole, to the *nearest tenth of a foot*?

- 1) 4.4
- 2) 6.7
- 3) 9.5
- 4) 12.3

- 4 As shown in the diagram below, a building casts a 72-foot shadow on the ground when the angle of elevation of the Sun is  $40^\circ$ .



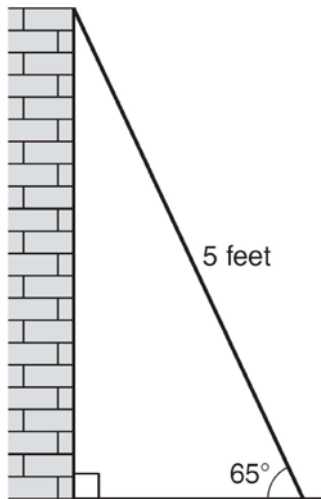
How tall is the building, to the *nearest foot*?

- 1) 46
- 2) 60
- 3) 86
- 4) 94

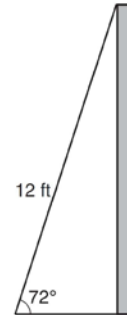
- 5 A right triangle contains a  $38^\circ$  angle whose adjacent side measures 10 centimeters. What is the length of the hypotenuse, to the *nearest hundredth of a centimeter*?

- 1) 7.88
- 2) 12.69
- 3) 12.80
- 4) 16.24

- 6 As shown in the diagram below, a ladder 5 feet long leans against a wall and makes an angle of  $65^\circ$  with the ground. Find, to the *nearest tenth of a foot*, the distance from the wall to the base of the ladder.

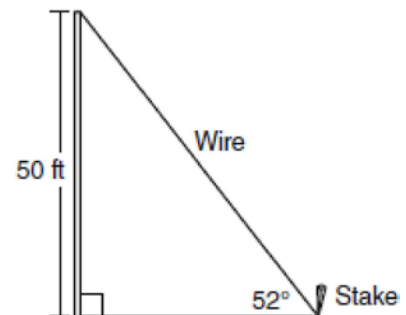


- 7 As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of  $72^\circ$  with the ground.



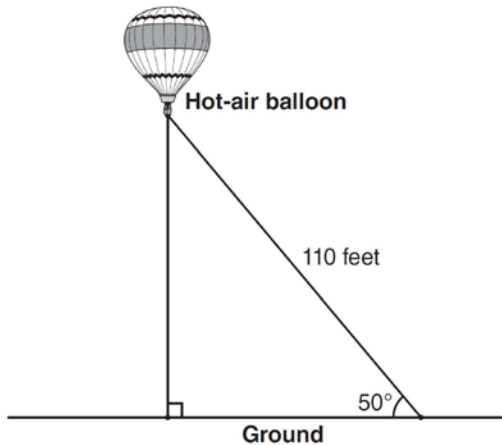
Find, to the *nearest tenth of a foot*, the distance from the wall to the base of the ladder.

- 8 A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of  $52^\circ$ .



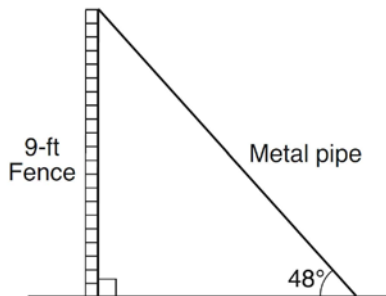
How far away from the base of the pole should the stake be driven in, to the *nearest foot*? What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?

- 9 A hot-air balloon is tied to the ground with two taut (straight) ropes, as shown in the diagram below. One rope is directly under the balloon and makes a right angle with the ground. The other rope forms an angle of  $50^\circ$  with the ground.



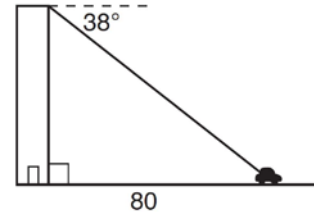
Determine the height, to the *nearest foot*, of the balloon directly above the ground. Determine the distance, to the *nearest foot*, on the ground between the two ropes.

- 10 A metal pipe is used to hold up a 9-foot fence, as shown in the diagram below. The pipe makes an angle of  $48^\circ$  with the ground.

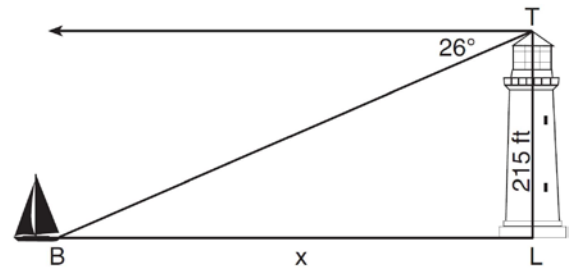


Determine, to the *nearest foot*, how far the bottom of the pipe is from the base of the fence. Determine, to the *nearest foot*, the length of the metal pipe.

- 11 From the top of an apartment building, the angle of depression to a car parked on the street below is  $38^\circ$ , as shown in the diagram below. The car is parked 80 feet from the base of the building. Find the height of the building, to the *nearest tenth of a foot*.



- 12 The top of a lighthouse,  $T$ , is 215 feet above sea level,  $L$ , as shown in the diagram below. The angle of depression from the top of the lighthouse to a boat,  $B$ , at sea is  $26^\circ$ . Determine, to the *nearest foot*, the horizontal distance,  $x$ , from the boat to the base of the lighthouse.



**A.A.44: Using Trigonometry to Find a Side 1: Find the measure of a side of a right triangle, given an acute angle and the length of another side**  
**Answer Section**

1 ANS: 3

$$\cos 30 = \frac{x}{24}$$

$$x \approx 21$$

REF: 010912ia

2 ANS: 2

$$\tan 32 = \frac{x}{25}$$

$$x \approx 15.6$$

REF: 080914ia

3 ANS: 2

$$\sin 57 = \frac{x}{8}$$

$$x \approx 6.7$$

REF: 061108ia

4 ANS: 2

$$\tan 40 = \frac{x}{72}$$

$$x \approx 60$$

REF: 061516ia

5 ANS: 2

$$\cos 38 = \frac{10}{x}$$

$$x = \frac{10}{\cos 38} \approx 12.69$$

REF: 081126ia

6 ANS:

$$2.1. \cos 65 = \frac{x}{5}$$

$$x \approx 2.1$$

REF: 011133ia

7 ANS:

$$\cos 72 = \frac{x}{12}$$

$$x \approx 3.7$$

REF: 011531ia

8 ANS:

$$39, 63. \quad \tan 52 = \frac{50}{x} \quad \sin 52 = \frac{50}{x}$$

$$x \approx 39 \quad x \approx 63$$

REF: 060937ia

9 ANS:

$$84, 71 \quad \sin 50 = \frac{x}{110} \quad \cos 50 = \frac{y}{110}$$

$$x \approx 84 \quad y \approx 71$$

REF: 081039ia

10 ANS:

$$\tan 48 = \frac{9}{x} \quad \sin 48 = \frac{9}{y}$$

$$x \approx 8 \quad y \approx 12$$

REF: 011338ia

11 ANS:

$$\tan 38 = \frac{opp}{80}$$

$$opp = 80 \tan 38 \approx 62.5$$

REF: 011436ia

12 ANS:

$$\tan 26 = \frac{215}{x}$$

$$x = \frac{215}{\tan 26}$$

$$x \approx 441$$

REF: 081434ia