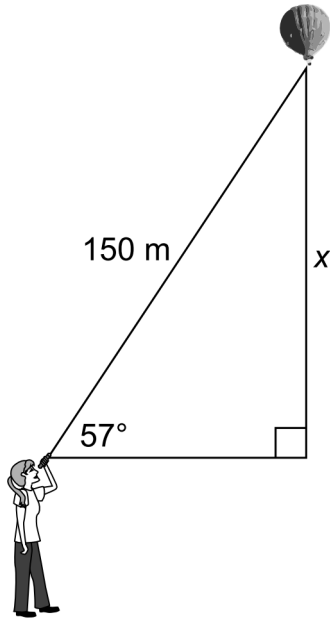


Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Use the diagram to answer the question.

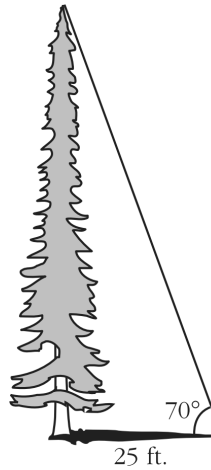


Note: Not to scale

Diana looks up at an angle of  $57^\circ$  and sees a hot air balloon 150 meters away. To the nearest meter, what is the value of  $x$ , the height of the hot air balloon above Diana's head?

- A. 82 meters                      B. 126 meters  
C. 179 meters                      D. 231 meters

2. Use the diagram and table below to answer the following question.



Angle	sin	cos	tan
$20^\circ$	0.3420	0.9397	0.3640
$70^\circ$	0.9397	0.3420	2.7475
$90^\circ$	1.0000	0.0000	—

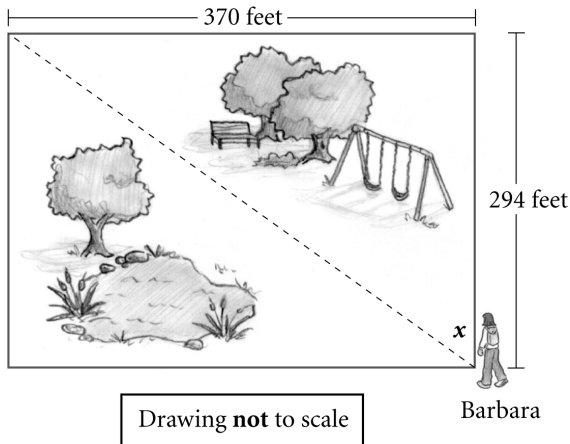
In the diagram above, the length of the tree's shadow is 25 feet. The angle of elevation from the tip of the shadow to the top of the tree is  $70^\circ$ . How tall is the tree to the nearest tenth of a foot?

- A. 9.1 ft.                              B. 23.5 ft.  
C. 68.7 ft.                              D. 73.10 ft.

3. A 24-foot ladder is leaning against a building. The base of the ladder is 9 feet from the building. If  $\alpha$  is the angle formed by the ladder and the ground, which equation could be used to find the measure of  $\alpha$ ?

- A.  $\sin \alpha = \frac{24}{9}$                               B.  $\cos \alpha = \frac{9}{24}$   
C.  $\cos \alpha = \frac{24}{9}$                               D.  $\sin \alpha = \frac{9}{24}$

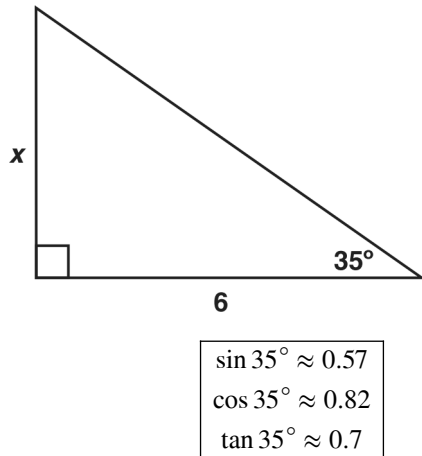
4. Barbara went for a walk in the city park. To cut across the rectangular park, she chose the path shown by the dotted line in the drawing below.



At what angle,  $x$ , did Barbara cut across the park? Round the answer to the nearest tenth of a degree.

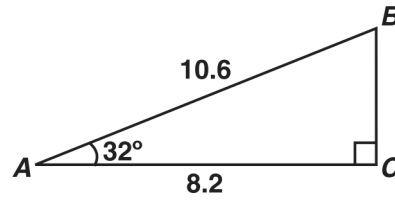
- A. 37.4    B. 38.5    C. 51.5    D. 52.6

5. What is the approximate value of  $x$  in the triangle below?



- A. 3.4 units                      B. 4.2 units  
C. 4.9 units                      D. 7.3 units

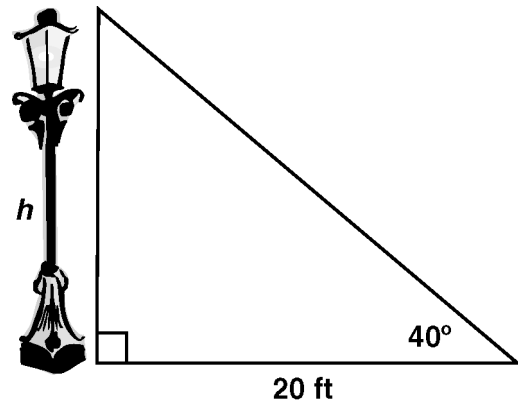
6. Right triangle  $ABC$  is pictured below.



Which equation gives the correct value for  $BC$ ?

- A.  $\sin 32^\circ = \frac{BC}{8.2}$                       B.  $\cos 32^\circ = \frac{BC}{10.6}$   
C.  $\tan 58^\circ = \frac{8.2}{BC}$                       D.  $\sin 58^\circ = \frac{BC}{10.6}$

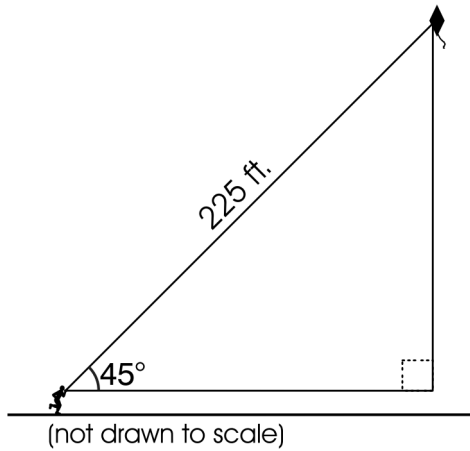
7. Approximately how many feet tall is the streetlight?



$$\begin{aligned} \sin 40^\circ &\approx 0.64 \\ \cos 40^\circ &\approx 0.77 \\ \tan 40^\circ &\approx 0.84 \end{aligned}$$

- A. 12.8    B. 15.4    C. 16.8    D. 23.8

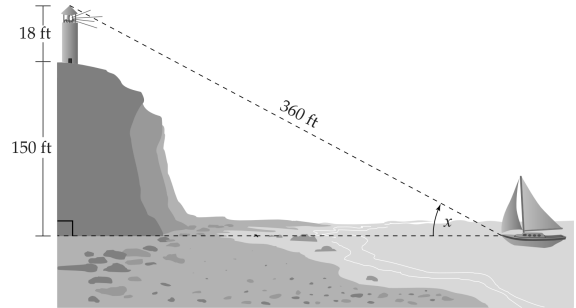
8. Use the diagram below to answer the following question(s).



It is believed that the best angle to fly a kite is  $45^\circ$ . If you fly a kite at this angle and let out 225 feet of string, *approximately* how high above the ground will the kite be?

- A. 250 feet                      B. 200 feet  
C. 150 feet                      D. 100 feet

9. A lighthouse, which is 18 feet high, stands on a cliff that is 150 feet above sea level. The distance from the top of the lighthouse to a sailboat on the ocean is 360 feet.

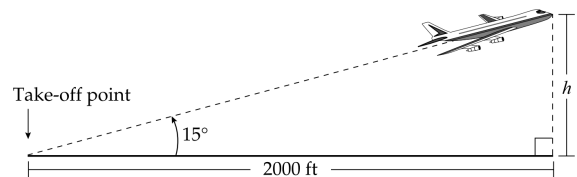


*Note:* The figure is not drawn to scale.

What is the angle of elevation ( $x$ ) from the sailboat to the top of the lighthouse? Round the answer to the nearest degree.

- A.  $25^\circ$     B.  $28^\circ$     C.  $62^\circ$     D.  $65^\circ$

10. An airplane makes a  $15^\circ$  angle of elevation from the runway when it takes off. The airplane pictured below is 2,000 feet along the ground from its take-off point.

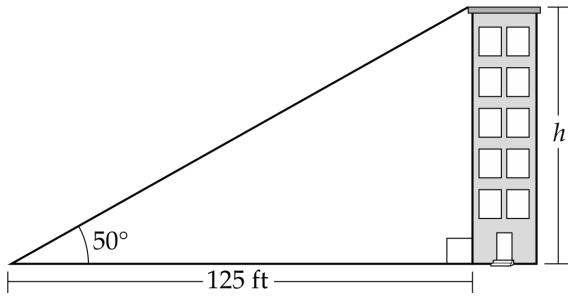


*Note:* The figure is not drawn to scale.

At what height ( $h$ ) is the airplane? Round the answer to the nearest foot.

- A. 500 feet                      B. 518 feet  
C. 536 feet                      D. 550 feet

11. From a point 125 feet from the base of a building, the angle of elevation from the ground to the top of the building is  $50^\circ$ .

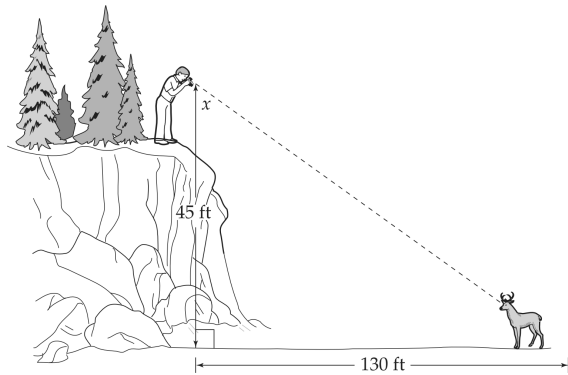


Note: The figure is not drawn to scale.

What is the height ( $h$ ) of the building? Round the answer to the nearest foot.

- A. 105 feet                      B. 149 feet  
C. 163 feet                      D. 194 feet

12. A tourist views a deer from a height of 45 feet. The horizontal distance between the tourist and the deer is 130 feet.

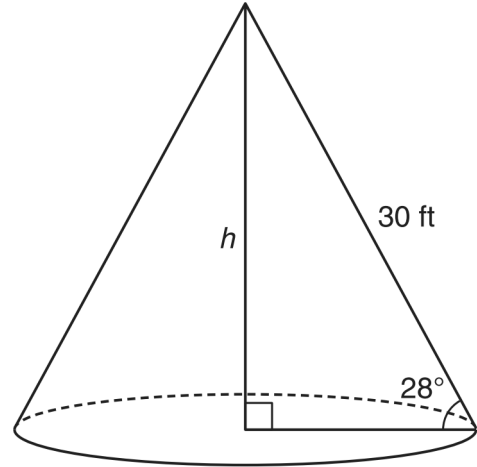


Note: The figure is not drawn to scale.

At what angle ( $x$ ) should the tourist hold his camera to photograph the deer? Round the answer to the nearest degree.

- A.  $19^\circ$     B.  $45^\circ$     C.  $71^\circ$     D.  $138^\circ$

13. A concrete mixing company stores sand in a pile in the shape of a right cone.



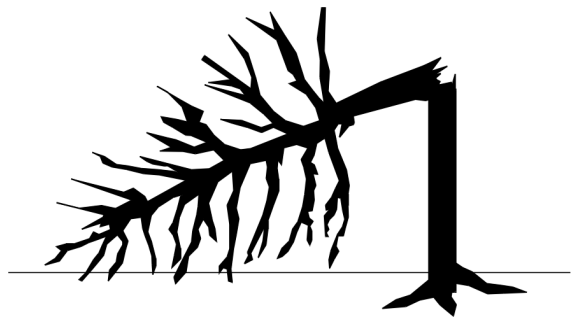
(Not drawn to scale)

What is the height,  $h$ , of the pile of sand, to the nearest foot?

$$(\sin 28^\circ \approx 0.4695, \cos 28^\circ \approx 0.8829, \tan 28^\circ \approx 0.5317)$$

- A. 10 ft    B. 14 ft    C. 16 ft    D. 26 ft

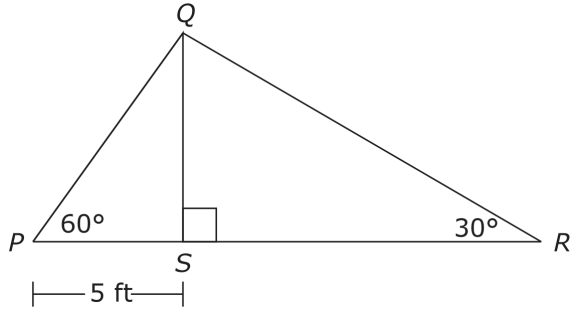
14. A dead tree was struck by lightning, causing it to fall over at a point 10 ft up from its base.



If the fallen treetop forms a  $40^\circ$  angle with the ground, *about* how tall was the tree originally?

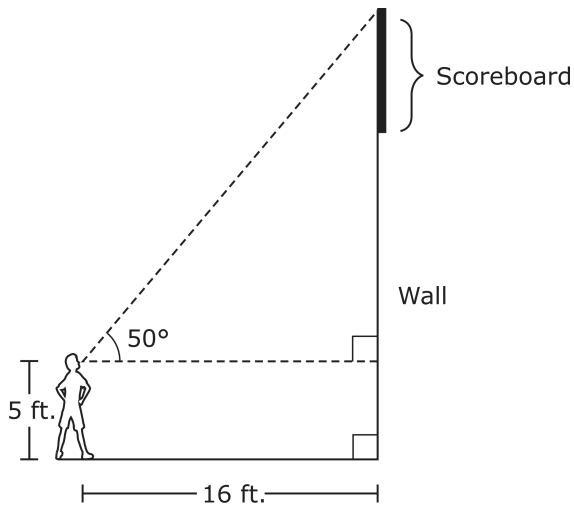
- A. 13 ft    B. 16 ft    C. 23 ft    D. 26 ft

15. What is the length of  $\overline{RS}$  in the triangle shown below?



- A. 8.7 ft    B. 15.0 ft    C. 17.3 ft    D. 20.0 ft

- 16.

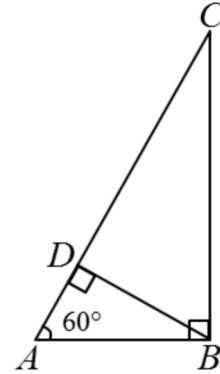


	sin	cos	tan
$50^\circ$	0.766	0.643	1.192

Latisha stands 16 feet from a wall where a scoreboard hangs. From 5 feet above the floor, the angle of elevation to the top of the scoreboard is  $50^\circ$ . To the nearest tenth of a foot, how far above the floor is the top of the scoreboard?

- A. 15.3 feet                      B. 17.3 feet  
C. 19.1 feet                      D. 24.1 feet

17. In  $\triangle ABC$  below,  $AC = 12$ . What is the length of segment  $BD$ .



- A.  $3\sqrt{2}$     B.  $3\sqrt{3}$     C. 6    D.  $6\sqrt{2}$

1.  
Answer: B
2.  
Answer: C
3.  
Answer: A
4.  
Answer: C
5.  
Answer: B
6.  
Answer: C
7.  
Answer: C
8.  
Answer: C
9.  
Answer:
10.  
Answer:
11.  
Answer:
12.  
Answer:
13.  
Answer: B
14.  
Answer: D
15.  
Answer: B
16.  
Answer: B
17.  
Answer: B