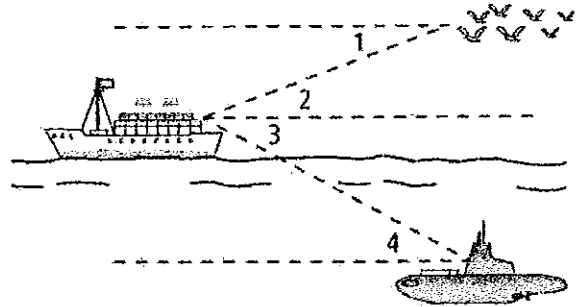


Name: Key

Describe each angle as it relates to the situation in the diagram.

1. $\angle 1$ depression	2. $\angle 2$ elevation
3. $\angle 3$ depression	4. $\angle 4$ elevation



Find the value of  $x$  and round to the nearest tenth.

5.  $\tan 30 = \frac{x}{300}$   
 $300 \tan 30 = x$   
 $x = 173.2 \text{ ft}$

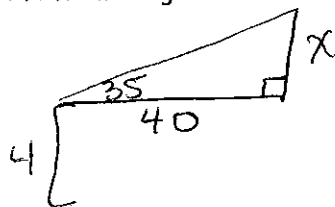
6.  $\cos 40 = \frac{x}{125}$   
 $125 \cos 40 = x$   
 $x = 95.8 \text{ ft}$

7.  $\tan 45 = \frac{60}{x}$   
 $x = \frac{60}{\tan 45}$   
 $x = 60 \text{ ft}$

8.  $\tan 25 = \frac{x}{75}$   
 $75 \tan 25 = x$   
 $x = 35.0 \text{ yd}$

Solve each word problem. Be sure to draw a picture. Round your answer to the nearest tenth.

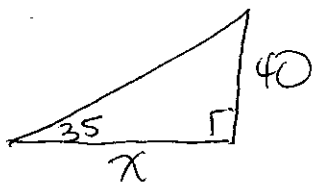
9. A person is standing 40 ft from a flagpole and can see the top of the pole at a  $35^\circ$  angle of elevation. The person's eye level is 4 ft from the ground. What is the height of the flagpole to the nearest foot?



$$\tan 35 = \frac{x}{40}$$

$$x = 28.0 + 4 = 32.0 \text{ ft}$$

10. An eagle perched 40 ft up in a tree looks down at a  $35^\circ$  angle of depression and spots a vole. How far is the vole from the eagle to the nearest tenth of a foot?

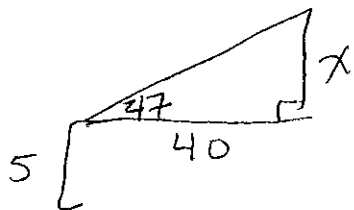


$$\tan 35 = \frac{40}{x}$$

$$x = \frac{40}{\tan 35}$$

$$x = 57.1 \text{ ft}$$

11. You stand 40 ft from a tree. The angle of elevation from your eyes (5 ft above the ground) to the top of the tree is  $47^\circ$ . How tall is the tree? Round your answer to the nearest foot.



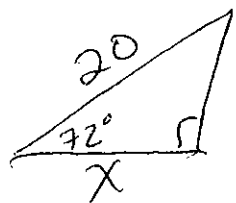
$$\tan(47) = \frac{x}{40}$$

$$40 \tan(47) = x$$

$$x = 42.89 + 5$$

$$x = 46.9 \text{ ft}$$

12. A 20 foot ladder leans against a building and makes an angle of  $72^\circ$  with the ground. Find the distance between the foot of the ladder and the building.

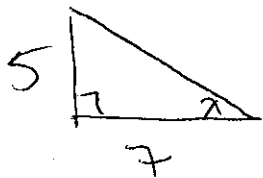


$$\cos 72 = \frac{x}{20}$$

$$20 \cos 72 = x$$

$$x = 6.2 \text{ ft}$$

13. Find the angle of elevation of the sun when a boy 5 ft. tall casts a shadow 7 feet long.

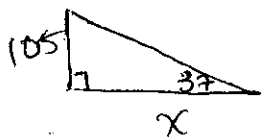


$$\tan x = \frac{5}{7}$$

$$\tan^{-1}\left(\frac{5}{7}\right)$$

$$35.5^\circ$$

14. A man stands at the top of a 105 foot light house and sees a boat. The angle of depression to sight the boat is  $37^\circ$ . Find the distance between the base of the light house and the boat.

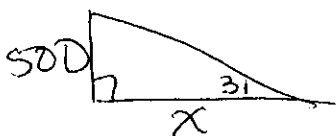


$$\tan 37 = \frac{105}{x}$$

$$x = \frac{105}{\tan 37}$$

$$x = 139.3 \text{ ft}$$

15. An observer in an airplane at a height of 500 meters sees a car at an angle of depression of  $31^\circ$ . How far is the car from the barn?



$$\tan 31 = \frac{500}{x}$$

$$x = \frac{500}{\tan 31}$$

$$x = 832.1 \text{ m}$$