Application Problems using Similar Triangles   Name KEY   Date_____
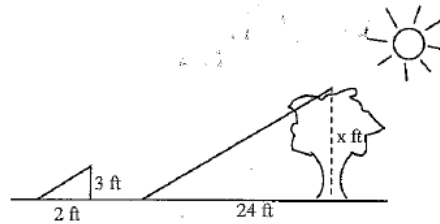
1. If a tree casts a 24-foot shadow at the same time that a yardstick casts a 2-foot shadow, find the height of the tree.
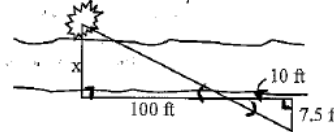
$$\frac{2}{24} = \frac{3}{x}$$

$$72 = 2x$$

$$36_{ft} = x$$

x ft

3 ft
2 ft   24 ft

2. A bush is sighted on the other side of a canyon. Find the width of the canyon.

$$\frac{7.5}{x} = \frac{10}{100}$$

$$10x = 750$$

$$x = 75 ft$$

x
100 ft   10 ft
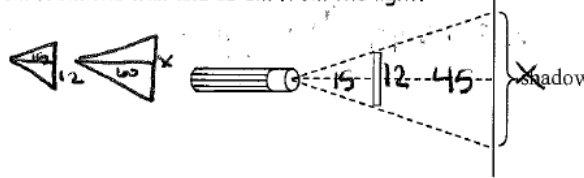7.5 ft

3. A 12-centimeter rod is held between a flashlight and a wall as shown. Find the length of the shadow on the wall if the rod is 45 cm from the wall and 15 cm from the light.
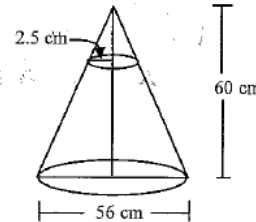
$$\frac{12}{x} = \frac{15}{60}$$

$$48_{cm} = x$$

12   60   x
15 12 45   shadow

4. The cheerleaders at City High make their own megaphones by cutting off the small end of a cone made from heavy paper. If the small end of the megaphone is to have a radius of 2.5 cm, what should be the height of the cone that is cut off?

$$\frac{5}{56} = \frac{x}{60}$$

$$x = 5.4 cm$$

2.5 cm
60 cm
56 cm

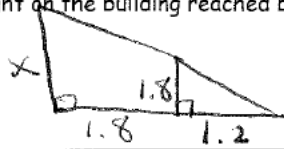5. Find the width of the Brady River.

$$\frac{15}{8} = \frac{43+x}{15+x}$$

$$225 + 15x = 344 + 8x$$

$$7x = 119$$

$$\underline{x = 17m}$$

7 m   x   8 m
28 m
15 m   8 m   Brady River

6. The foot of a ladder is 1.2 m from a fence that is 1.8 m high. The ladder touches the fence and rests against a building that is 1.8 m behind the fence. Draw a diagram, and determine the height on the building reached by the top of the ladder.
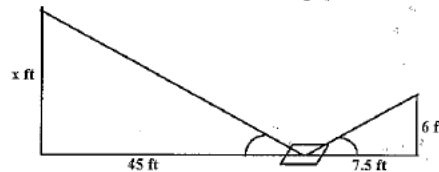
$$\frac{1.2}{3} = \frac{1.8}{x}$$

$$x = 4.5m$$

7. Ramon places a mirror on the ground 45 ft from the base of a geyser. He walks backward until he can see the top of the geyser in the middle of the mirror. At that point, Ramon's eyes are 6 ft above the ground and he is 7.5 ft from the mirror. Use similar triangles to find the height of the geyser.
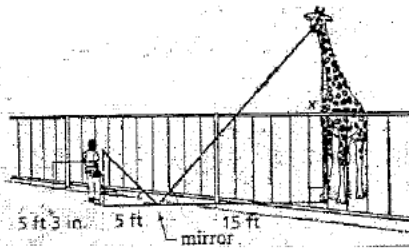
$$\frac{7.5}{45} = \frac{6}{x}$$

$$x = 36 ft$$

x ft

45 ft   6 ft   7.5 ft

8. Find the height of the giraffe in the diagram below.

$$\frac{5}{15} = \frac{5.25}{x}$$

$$x = 15 ft \ ^9 inches$$

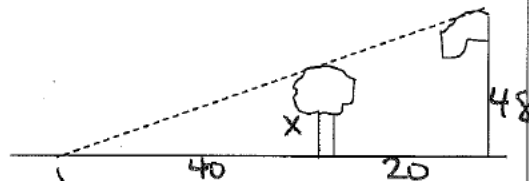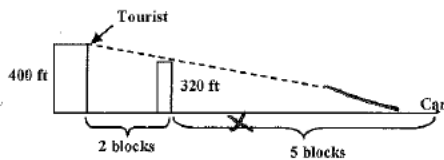5 ft 3 in.   5 ft   15 ft   mirror

9. On level ground, the base of a tree is 20 ft from the bottom of a 48-ft flagpole. The tree is shorter than the pole. At a certain time, their shadows end at the same point 60 ft from the base of the flagpole. How tall is the tree?

$$\frac{x}{48} = \frac{40}{60}$$

$$x = 32 ft.$$

x   48   40   20

10. A tourist on the observation deck of a 400 ft building looks east, facing another building 320 ft high and two blocks from the first building. Her car is parked five blocks east of the second building. If no other buildings intervene, can she see her car?

Tourist

400 ft   320 ft   Car

2 blocks   5 blocks

$$\frac{400}{320} = \frac{2+x}{x}$$

$$400x = 640 + 320x$$

$$x = 8$$

(no)