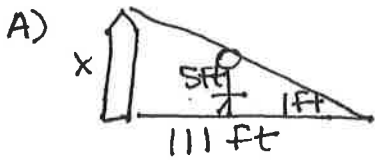


- Maria is visiting Washington D.C. She wants to know the height of the Washington Monument. The monument's shadow is 111 feet at the same time that Maria's shadow is 1 foot. Maria is 5 feet tall.

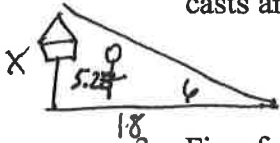
- Draw a figure to represent the problem. Label all known distances.
- Determine the height of the Washington Monument.



B)
$$\frac{x}{111} = \frac{5}{1}$$

$$x = \boxed{555 \text{ ft}}$$

- A person 5.25 feet tall casts a 6 foot shadow. At the same time of day, a lamppost casts an 18 foot shadow. What is the height of the lamppost?



$$\frac{x}{18} = \frac{5.25}{6}$$

$$60x = 94.5$$

$$x = \boxed{15.75 \text{ ft}}$$

- Five-foot tall Melody casts an 84 inch shadow. How tall is her friend if, at the same time of day, his shadow is 1 foot shorter than hers?

$$\frac{5}{7} = \frac{x}{6} \text{ or } \frac{5}{84} = \frac{x}{72}$$

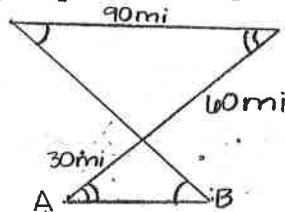
$$x = \boxed{4.28 \text{ ft rounded}} \quad \boxed{51.4 \text{ in}}$$

- The state highway department is considering the possibility of building a tunnel through the mountain from point A to point B. Surveyors provided the given map. How long would the tunnel be?

$$\frac{30}{60} = \frac{x}{90}$$

$$2700 = 60x$$

$$x = \boxed{45 \text{ miles}}$$

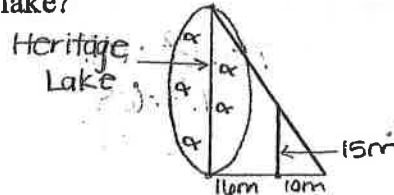


- Antoine wants to find the distance across Heritage Lake. According to his measurements, what is the distance across the lake?

$$\frac{x}{26} = \frac{15}{10}$$

$$10x = 390$$

$$x = \boxed{39 \text{ m}}$$

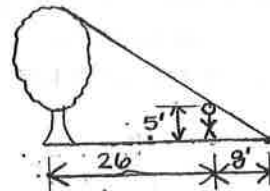


- Ranger Lopez wants to know how tall the tree is that she planted five years ago. She walks away from the tree until the end of her shadow and the tree's shadow coincides. Use her measurements to determine the height of the tree.

$$\frac{5}{8} = \frac{x}{34}$$

$$170 = 8x$$

$$x = \boxed{21.25 \text{ ft}}$$



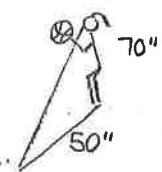
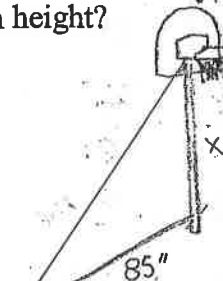
- Kim wants to know the height of a basketball hoop. The regulation height is 10 feet. Use Kim's height and the length of the shadows shown in the diagram to find the height of the basketball hoop. Is the hoop at regulation height?

$$\frac{x}{85} = \frac{70}{50}$$

$$50x = 9150$$

$$x = 119 \text{ in} \approx 9.916 \text{ ft}$$

no not regulation

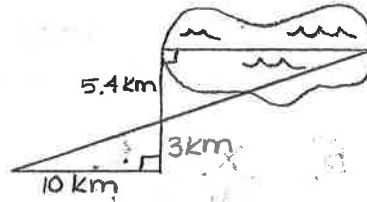


8. Suppose that a military engineer needs to know the width of a lake in order to build a temporary bridge. Using a point on the opposite side of the lake as a reference point, the engineer sets up right triangles along the sides of the lake. Using the diagram, estimate the width of the lake.

$$\frac{5.4}{x} = \frac{3}{10}$$

$$54 = 3x$$

$$x = 18 \text{ km}$$



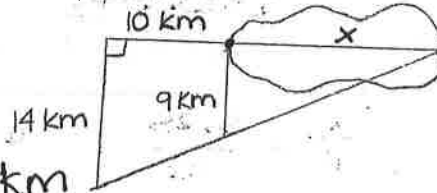
9. Use the diagram to estimate the width of the given lake.

$$\frac{14}{x+10} = \frac{9}{x}$$

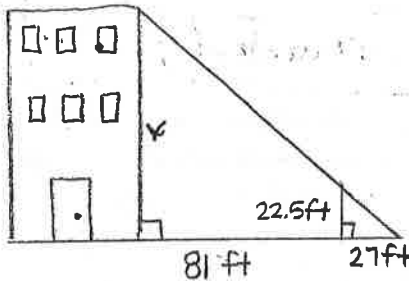
$$14x = 9x + 90$$

$$5x = 90$$

$$x = 18 \text{ km}$$



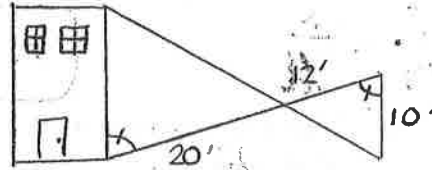
10. Use the diagrams to find the height of each building.



$$\frac{22.5}{27} = \frac{x}{108}$$

$$27x = 2430$$

$$x = 90 \text{ ft}$$

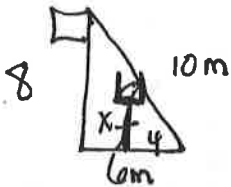


$$\frac{20}{12} = \frac{x}{30}$$

$$12x = 600$$

$$x = 50 \text{ ft}$$

11. A 10 meter rope from the top of a flagpole reaches to the end of a flagpole's 6 meter shadow. How tall is the nearby football goalpost if, at the same moment, it has a shadow of 4 meters?



$$x^2 + 6^2 = 100$$

$$x^2 = 64$$

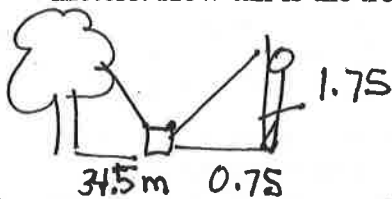
$$x = 8$$

$$\frac{8}{6} = \frac{x}{4}$$

$$6x = 32$$

$$x = 5.3 \text{ m}$$

12. To estimate the height of a tree, a Girl Scout sights the top of the tree in a mirror that is 34.5 meters from the tree. The mirror is on the ground that faces upward. The scout is 0.75 meters from the mirror and the distance from her eyes to the ground is about 1.75 meters. How tall is the tree?



$$\frac{x}{34.5} = \frac{1.75}{0.75}$$

$$0.75x = 60.375$$

$$x = 80.5 \text{ m}$$

13. Hannah is building a sawhorse. According to the diagram, how long should she make the brace?

$$\frac{16}{x} = \frac{28}{21}$$

$$28x = 336$$

$$x = 12 \text{''}$$

