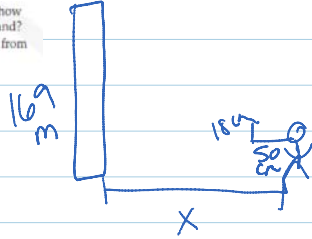2. The Washington Monument is 169 meters high. About how far should you stand from it to block it out with your hand? Assume your hand is 18 cm long and you hold it 50 cm from your eye.
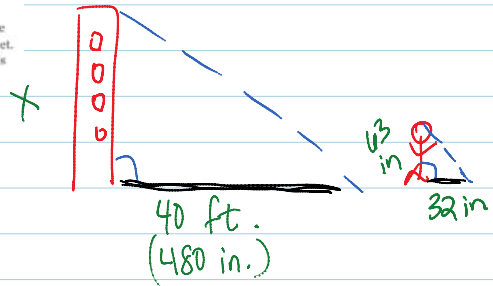
*Convert cm to m!

169 m

18 cm
50 cm

$$\frac{.18}{169} = \frac{.50}{x}$$

$$84.5 = .18x$$

$$\boxed{x = 469.44 \text{ m.}}$$

3. To estimate the height of a building, a 5-foot-3-inch tall person measured her shadow while her friend measured the shadow of the building. The building cast a shadow of 40 feet. Her shadow is 32 inches long. To the nearest foot, how tall is the building?
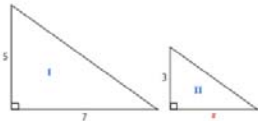
x

40 ft.
(480 in.)

63 in

32 in.

$$\frac{x}{63} = \frac{480}{32}$$

$$x = 945 \text{ in.}$$
$$78.75 \text{ ft} = \boxed{78 \text{ ft } 9 \text{ in.}}$$

5. Students are told that Triangle I and Triangle II are similar.

5
I
7

3
II
II

Three students set up the following proportions:

Student A: $\frac{5}{7} = \frac{3}{x}$ Student B: $\frac{5}{3} = \frac{7}{x}$ Student C: $\frac{x}{7} = \frac{3}{5}$

The instructor said that all three proportions are correct. Explain each student's thinking.

Student A: $\frac{\text{short I}}{\text{long I}} = \frac{\text{short II}}{\text{long II}}$

Student B: $\frac{\text{short I}}{\text{short II}} = \frac{\text{long I}}{\text{long II}}$

Student C: $\frac{\text{long II}}{\text{long I}} = \frac{\text{short II}}{\text{short I}}$

6. Another method that can be used to find the height of an object indirectly is often called the *mirror method*. In this method, a mirror with a dot on it is placed between a person and the object to be measured. The person looks into the mirror and walks back and forth until he can see the top of the object on the dot in the mirror.

If the person knows his height (to his eye), his distance from the dot on the mirror, and the distance between the mirror and the object, he can use similar triangles to find the height of the object.
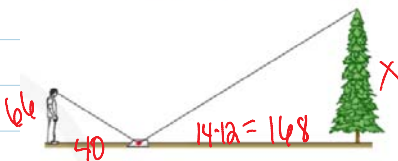
Suppose your eye is 66 inches above the ground and your feet are 40 inches from the dot on the mirror. How tall is the tree if the mirror is 14 feet away from the tree?

66
40
14·12 = 168
x

$$\frac{66}{40} = \frac{x}{168}$$

$$x = 277.2 \text{ in.} = 23.1 \text{ ft} \approx \boxed{23 \text{ ft } 1 \text{ in}}$$