Name: Key Hr:

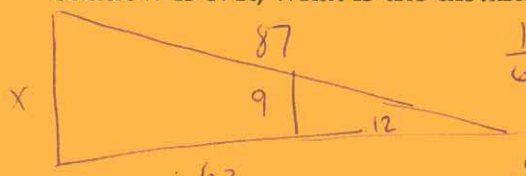
10.1 Applications using Proportions and Ratios

1. $\frac{15}{y} = \frac{40}{12}$ $\frac{180}{40} = \frac{40y}{40}$ $y = 4.5$

2. $\frac{y}{42.3} = \frac{144}{56.4}$ $\frac{56.4y}{56.4} = \frac{6091.2}{56.4}$ $y = 108$

3. $\frac{126}{k+3} = \frac{14}{3}$ $14k + 42 = 378$ $-42 \quad -42$ $14k = 336$ $k = 24$

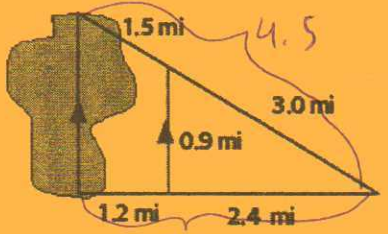
4. A 9ft tall stop sign casts a 12ft shadow. A building near this stop sign casts a 63ft shadow. a) How tall is the building? b) If the distance from the top of the building to the end of the shadow is 87ft, what is the distance from the top of the stop sign to the end of its shadow?



$\frac{12}{63} = \frac{9}{x}$ $12x = 567$

a) $x = 47$
b) 16.6 ft

5. Find the length of the lake.



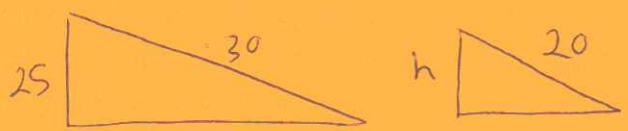
$\frac{2.4}{3.6} = \frac{.9}{x}$ $2.4x = 3.24$ $x = 1.35$

6. A Tower casts a shadow of 64 feet. A 6-foot pole near the tower casts a shadow 8 feet long. How tall is the tower?

$\frac{64}{8} = \frac{t}{6}$ $t = 48$

7. A ladder that is 30ft tall leans 25ft up against the side of a building. Up against the same building, how far up would a 20ft ladder go?

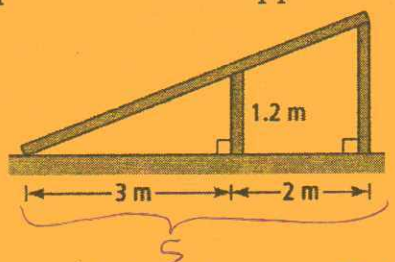
at the same angle



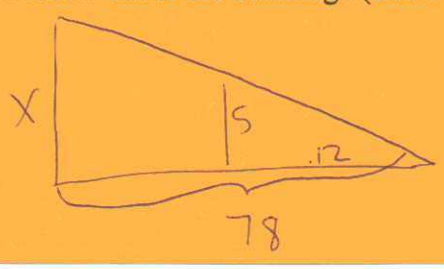
$\frac{25}{h} = \frac{30}{20}$ $500 = 30h$ $h = 16.7$

8. Sam built a ramp to a loading dock. The ramp has a vertical support 2 meters from the base of the loading dock and 3 meters from the base of the ramp. If the vertical support is 1.2 meters in height, what is the height of the loading dock?

$\frac{1.2}{h} = \frac{3}{5}$ $6 = 3h$ $h = 2$



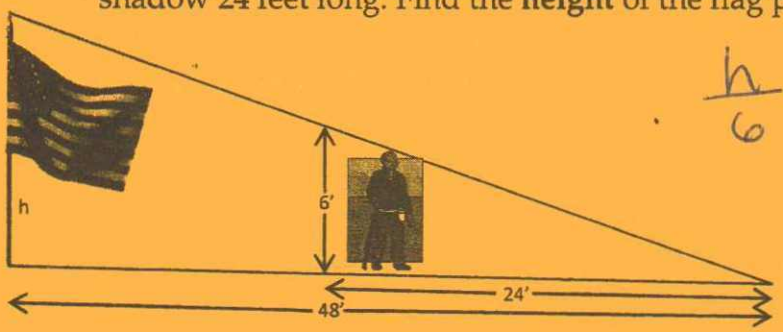
9. Cameron is 5 ft tall and casts a 12 ft shadow. At the same time of day, a nearby building casts a 78 ft shadow. How tall is the building? (Draw a picture)



10. Emily is moving and needs to pack two mirrors. The largest mirror fits in a box that is 18 inches wide by 20 inches long. Her smaller mirror is similar in proportion to the larger mirror. Emily determines that the width of the smaller box needs to be a minimum of 9 inches. What should the minimum length of the box be to hold the smaller mirror?

$\frac{18}{20} = \frac{9}{x}$ $\frac{18x}{18} = \frac{180}{18}$ $x = 10$ **10 inches long**

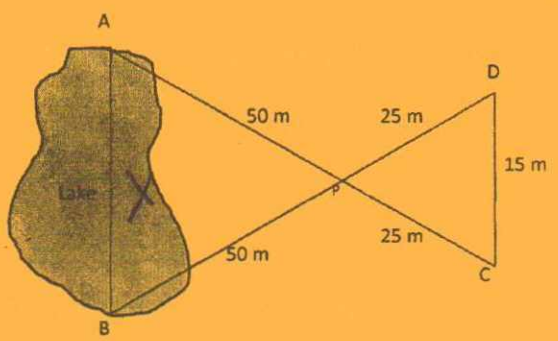
11. A flagpole casts a shadow 48 feet long at the same time that a 6 foot tall person casts a shadow 24 feet long. Find the **height** of the flag pole.



$\frac{h}{6} = \frac{48}{24}$ $\frac{24h}{24} = \frac{288}{24}$

h = 12 ft

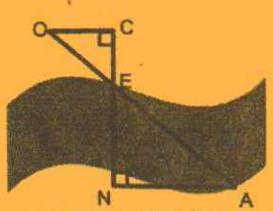
12. Find the length of the **lake** (in meters).



$\frac{15}{x} = \frac{25}{50}$

lake is 30 m

In order to estimate the width of a river, the following technique can be used. Use the diagram on the left for questions **9-13**. Place three markers, O, C and E on the upper bank of the river. ***E*** is on the edge of the river and $\overline{OC} \perp \overline{CE}$. Go across the river and place a marker, ***N*** so that it is collinear with C and E. Then, walk along the lower bank of the river and place marker A, so that $\overline{CN} \perp \overline{NA}$. $\overline{OC} = 50 feet$, $\overline{CE} = 30 feet$, $\overline{NA} = 80 feet$.



13. Is $\overline{OC} \| \overline{NA}$? How do you know?

yes, because $\overline{OC}$ & $\overline{NA}$ are both $\perp$ to CN, therefore they must be $\|$ to each other

14. What is the width of the river (EN)?

$\frac{50}{30} = \frac{80}{x}$ $\frac{50x}{50} = \frac{2,400}{50}$ **x = 48 ft**

15. Can we find (EA)? If so, find it. If not, explain.

yes, pythagorean theorem $48^2 + 80^2 = c^2$

$2,304 + 6,400 = c^2$

$8,704 = c^2$

$93.3 = c$