Name: _____ Date: _____

Grade 10 Applied Math: Similar Triangles

Knowledge _____/24 Application _____/9 Communication

1. State whether the ratios are proportional. Give reasons or show work to support your answers.

/6K

a) $\frac{5}{8}, \frac{15}{24}$

$5 \cdot 24 = 120$

$8 \cdot 15 = 120$

They are proportional since the cross products are equal.

b) $\frac{17}{20}, \frac{68}{90}$

$17 \cdot 90 = 1530$

$68 \cdot 20 = 1360$

They are not proportional since the cross products are not proportional.

c) 5.6:8.1, 33.6:48.6

$\frac{5.6}{8.1} = \frac{33.6}{48.6}$

$5.6 \cdot 48.6 = 272.16$

$8.1 \cdot 33.6 = 272.16$

They are proportional since the cross products are equal

2. Solve the following.

/6K

a) $\frac{x}{8} = \frac{3}{5}$

$5x = 24$

$x = 4.8$

b) $\frac{7}{9} = \frac{24.5}{h}$

$7h = 220.5$

$h = 31.5$

c) 3.5 : 10.5 = y : 12

$\frac{3.5}{10.5} = \frac{y}{12}$

$10.5y = 42$

$y = 4$

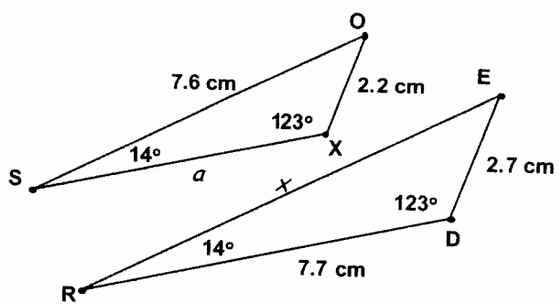
3. The triangles in each pair are similar. Find the unknown side lengths. Round to one decimal place where needed.

a) Find a and x.

$\frac{2.2}{2.7} = \frac{a}{7.7}$ $\quad$ $\frac{2.2}{2.7} = \frac{7.6}{x}$

$2.7a = 16.94$ $\quad$ $2.2x = 20.52$

$a = 6.3\text{cm}$ $\quad$ $x = 9.3\text{cm}$



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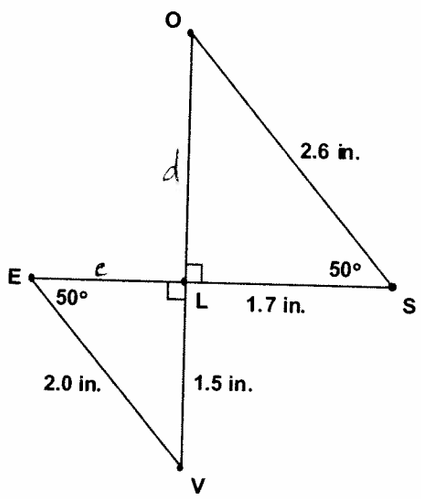
b) Find d and e.

/6K

$\frac{d}{1.5} = \frac{2.6}{2.0}$ $\quad$ $\frac{2.6}{2.0} = \frac{1.7}{e}$

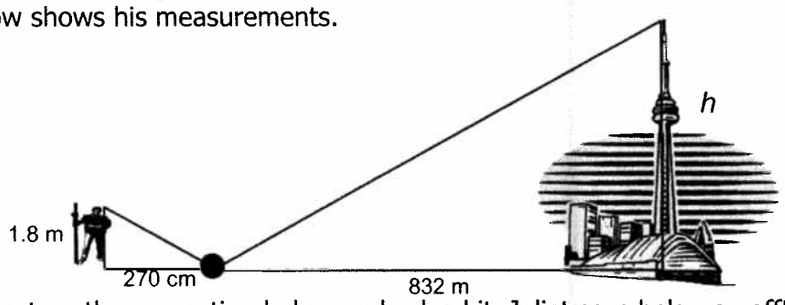
$2d = 3.9$ $\quad$ $2.6e = 3.4$

$d = 2\text{in}\ (1.95)$ $\quad$ $e = 1.3\text{in}$



Name: _____ Date: _____

4. Romeo was trying to find the height of the CN Tower using a mirror. The diagram below shows his measurements.



Romeo set up the proportion below and solved it. Juliet says he's way off!! Explain where Romeo went wrong and then find the height of the CN Tower.

$$\frac{1.8}{h} = \frac{832}{270}$$
$$832h = 270 \times 1.8$$
$$832h = 486$$
$$h = \frac{486}{832}$$
$$h = 0.58$$

Explain Romeo's mistake(s).

Romeo set up the second incorrectly. It should have been $\frac{270}{832}$. But he also forgot to convert his measurements so that they are all the same units.

Show your solution.

/5A

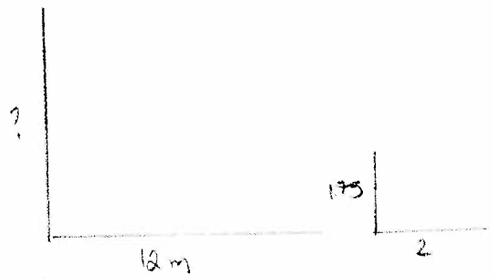
$\frac{1.8}{h} = \frac{2.7}{832}$

$2.7h = 1497.6$

$h = 555\text{m}$

5. Neha was trying to find the height of her house using shadows. She measures the length of the shadow of the house to be 12 m. She then measures her height, 1.75m, and her shadow, 2m. Determine the height of her house. (Include a labelled diagram.)

/4A



$\frac{h}{12} = \frac{1.75}{2}$

$2h = 21$

$h = 10.5\text{ m}$

∴ The house is 10.5 m.