Unit K Exam Review

1. A photo measures 5" by 7". If the shorter dimension of a similar photo is 10", what is the longer dimension?

    $$\frac{5}{7} \diagup \frac{10}{x}$$

    $$x = 14"$$

2. An image of a building in a photograph is 6 cm wide and 3 cm tall. If the image is similar to the actual building and the actual building is 144 meters wide, how tall is the actual building?

    $$\frac{3}{6} \diagup \frac{x}{144}$$

    $$x = 72cm$$

3. A painting is 16 in wide and 31 in high. A reproduction, which is similar to the original, is 11 in wide. How high is the reproduction?

    $$\frac{16}{31} = \frac{11}{x}$$

    $$x = 21.3"$$

4. If a rider covers 2.25 km in 9 minutes, how far can she travel in 1 hour?
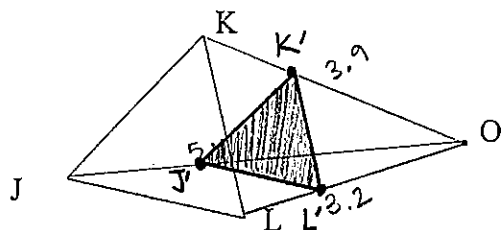   60min

    $$\frac{2.25}{9} = \frac{x}{60}$$

    $$x = 15 km$$

5. Mrs. Liu paid $11.44 for 8 gallons of gasoline. How much would she have to pay for a whole tankful if her tank holds 35 gallons?

    $$\frac{\$11.44}{8} = \frac{x}{35}$$

    $$x = \$50.05$$

6.   Draw the image of △JKL under a size change with center O and magnitude 2/3.
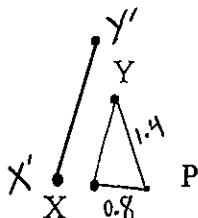

$$3.9 \times {}^2/_3 = 2.6$$
$$3.2 \times {}^2/_3 = 2.1$$
$$5.4 \times {}^2/_3 = 3.6$$

7.   Draw the image of XY under a size change with center P and magnitude 1.5.

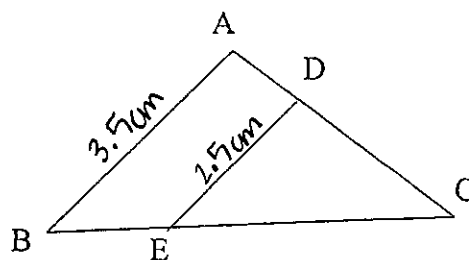$$1.4 \times 1.5 = 2.1$$
$$0.8 \times 1.5 = 1.2$$

8.   Let S be the size change such that $S_k(\triangle DEC)=\triangle ABC$.
start   end
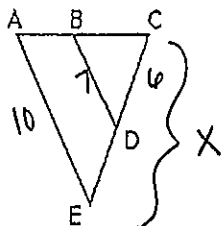
a.   Is this size change an expansion or
a contraction?
        expansion

b.   What is the value of k?
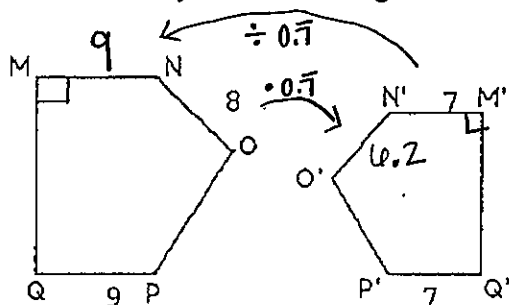
$$\frac{new}{old} \quad \frac{3.5}{2.5} = \boxed{1.4}$$

9.   △BCD ~ △ACE. If CD = 6, BD = 7,
and AE = 10, find CE to the nearest tenth.

$$\frac{7}{10} \times \frac{6}{x}$$

$$x = 8.57$$

Name: _____ Date: _____ Hour: _____

10. MNOPQ ~ M'N'O'P'Q', with sides and angle measures as indicated in the figure. Find as many other missing side lengths and angle measures as possible.

$$\frac{7}{9} = .\overline{7}$$

$$MN = 9$$

$$N'O' = 6.\overline{2}$$

$$\angle M' = 90°$$

11. a. On the coordinate axes to the right, graph the image of ABCD under $S_{0.5}$ and give the coordinates of the new vertices.
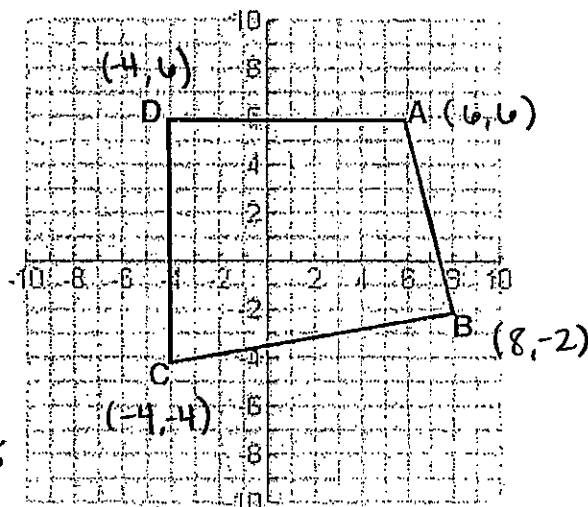
$A' = \underline{(3,3)}$ $B' = \underline{(4,-1)}$

$C' = \underline{(-2,-2)}$ $D' = \underline{(-2,3)}$

b. Show that the distance between A and D is half of the distance between A' and D'.

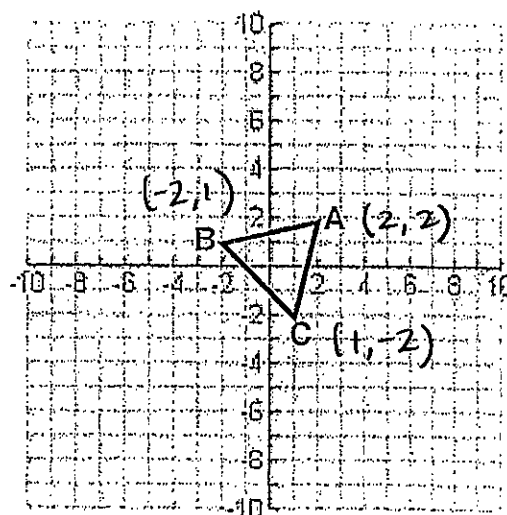$$AD = 10 \text{ units}, \quad A'D' = 5 \text{ units}$$

5 is half of 10.

12. a. On the coordinate axes to the right, graph the image of △ABC under $S_{2.5}$ and give the coordinates of the new vertices.

$A' = \underline{(5,5)}$

$B' = \underline{(-5, 2.5)}$

$C' = \underline{(2.5, -5)}$

b. What is $S_{0.25}(C)$? $\underline{(0.25, -0.5)}$

13. A hexagon has an area 90 in² and shortest side length 5 in. A similar hexagon has shortest side of length 4 in. What is the (area) of the similar hexagon?

$$\frac{new\ side}{old\ side} = \frac{4}{5} = .8 \xrightarrow{k} (0.8)^2 = .64 \times 90 = \boxed{57.6\,in^2}$$

14. A octagon has area 150 cm² and longest side length 10 cm. A similar octagon has longest side 4 cm. What is the (area) of the similar octagon?

$$\frac{new\ side}{old\ side} = \frac{4}{10} = .4 \xrightarrow{k^2} (0.4)^2 = .16 \times 150 = \boxed{24\,cm^2}$$

15. If a 16-inch pizza costs $9.50, at the same cost per square inch, what should an 18-inch pizza of the same thickness with the same ingredients cost? Round to the nearest cent.

$$\frac{new\ side}{old\ side} = \frac{18}{16} = 1.125 \xrightarrow{k^2} 1.125^2 = 1.27 \times \$9.50 = \boxed{\$12.02}$$

16. If it takes 3 tubes of gold paint to cover a cube with edge length 2 in, how much gold paint will it take to (cover) a cube with edge length 4 in?

$$\frac{new\ side}{old\ side} = \frac{4}{2} = 2 \xrightarrow{k^2} 2^2 = 4 \times 3\,tubes = \boxed{12\,tubes}$$

17. A figure with area 16 is transformed into a figure with area 64 under a size change of magnitude __k = 2__?

$$\frac{64}{16} = 4 \xrightarrow{k^2} \sqrt{4} = 2$$

18. If it takes 1200 gallons to (fill) a cylindrical swimming pool, how much would it take to fill a similar swimming pool with double the radius?

$$\overset{k}{2} \xrightarrow{k^3} 2^3 = 8 \times 12,000\,gall = \boxed{96,000\,gall}$$

19. When his height was measured at 8' 11.1", Robert Wadlow weighed 439 lbs. How much would a (5' 10") man (weigh) if he were similar in shape to Wadlow?

$$\frac{new\ side}{old\ side} = \frac{70}{107.1} = .65 \xrightarrow{k^3} (.65)^3 = .275 \times 439\,lbs$$

$$= \boxed{120.7\,lbs}$$