

Geometry

2- Similarity & Right Triangles

Name: _____ Date: _____

Similarity and Dilations

In the diagram, $\triangle CAT \sim \triangle DOG$. Use the diagram to find each of the following.

1. Scale factor of $\triangle CAT$ to $\triangle DOG$ (Simplify.)

Scale Factor = $\frac{18}{8} = \frac{9}{4} = 2.25$ **8:18**

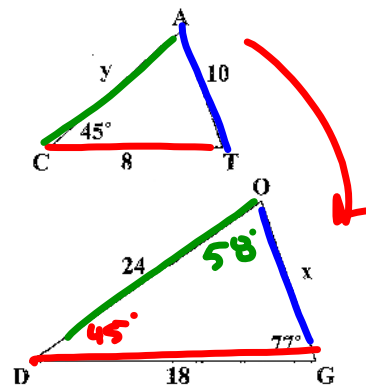
2. Find x and y (Show Work!)

$x = 10(2.25) = 22.5$ $y = 24/2.25 = 10.6$

3. Find $m\angle D = 45^\circ$

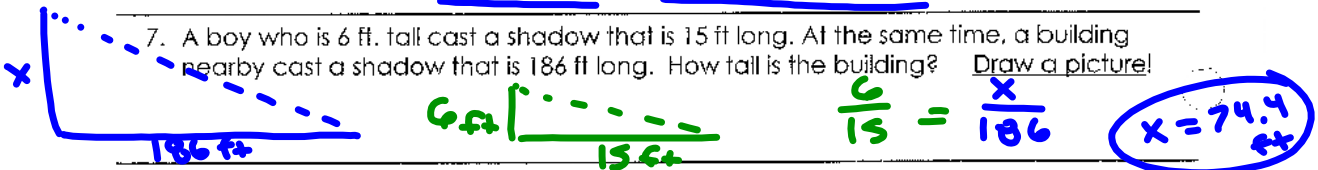
4. Find $m\angle O = 58^\circ$

5. Find $m\angle A = 58^\circ$



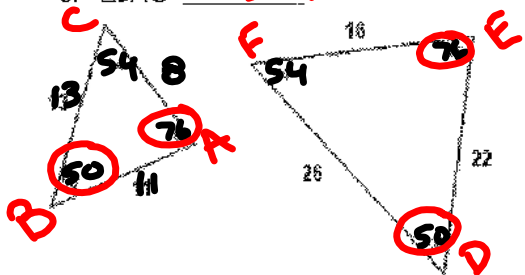
6. What is the ratio of the perimeter of $\triangle CAT$ to the perimeter of $\triangle DOG$? **4:9**

7. A boy who is 6 ft. tall cast a shadow that is 15 ft long. At the same time, a building nearby cast a shadow that is 186 ft long. How tall is the building? Draw a picture!

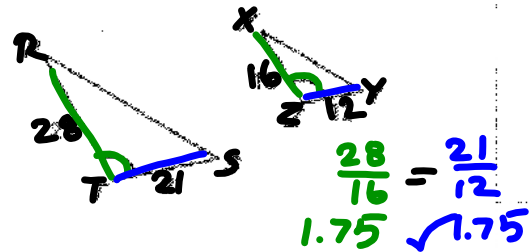


Explain why the triangles are similar and write a similarity statement.

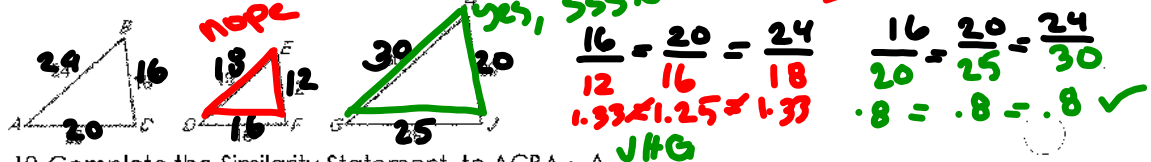
8. $\triangle BAC \sim \triangle DEF$ **AA ~**



9. $\triangle TRS \sim \triangle ZXY$ **SAS ~**



Determine which of the triangles ($\triangle DEF$ or $\triangle GHJ$) is similar to $\triangle ABC$:



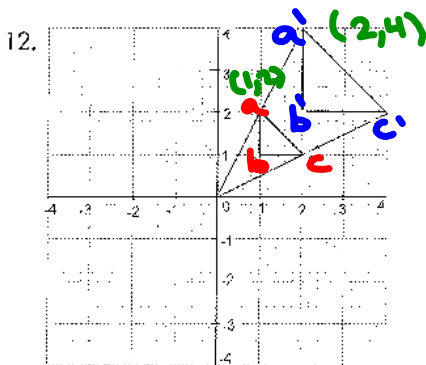
10. Complete the Similarity Statement to $\triangle CBA \sim \triangle$ **JHG**

11. Find the Scale Factor = **1.25**
 Getting larger, so $1/.8 = 1.25$ $\frac{img}{pic} = \frac{25}{20} = 1.25$

Geometry

2- Similarity & Right Triangles

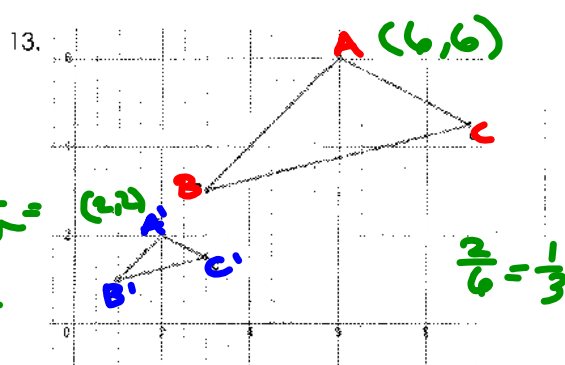
Determine whether the dilation from Figure ABC to Figure A'B'C' is a reduction or an enlargement. Then find its scale factor and simplify if possible.



$$\frac{\text{image}}{\text{pre-image}} = \frac{2}{1} = 2$$

Reduction or enlargement?

scale factor = 2



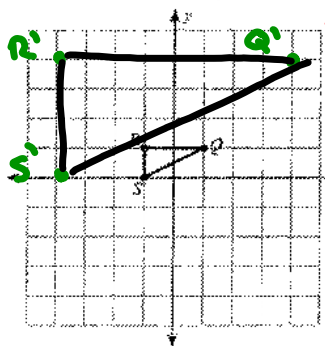
$$\frac{2}{6} = \frac{1}{3}$$

Reduction or enlargement?

scale factor = $\frac{1}{3}$

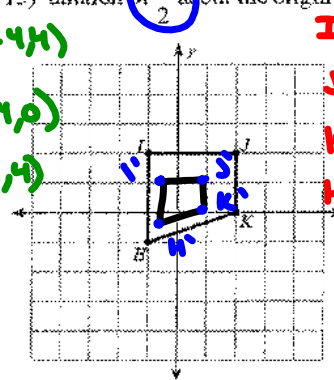
Graph the image of the figure using the transformation given.

14) dilation of 4 about the origin



$$\begin{aligned} R(-1,1) &\rightarrow R'(-4,4) \\ S(-1,0) &\rightarrow S'(-4,0) \\ Q(1,1) &\rightarrow Q'(4,4) \end{aligned}$$

15) dilation of $\frac{1}{2}$ about the origin



$$\begin{aligned} I(-1,2) &\rightarrow I'(-0.5,1) \\ J(2,2) &\rightarrow J'(1,1) \\ K(2,0) &\rightarrow K'(1,0) \\ H(-1,-1) &\rightarrow H'(-0.5,-0.5) \end{aligned}$$

Find the coordinates of the vertices of each figure after the given transformation. Identify if it is an enlargement or reduction.

16) dilation of $\frac{1}{2}$ about the origin **reduction**

$$R(-1, -1), S(0, 2), T(1, 2), U(2, -2)$$

$$R'(-0.5, -0.5) \quad S'(0, 1) \quad T'(0.5, 1) \quad U'(1, -1)$$

17) dilation of 2 about the origin **enlargement**

$$Z(-1, -1), Y(-1, 2), X(1, 1)$$

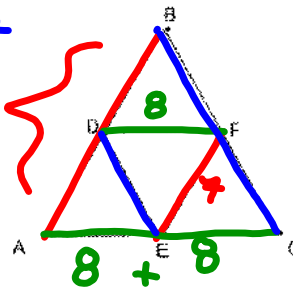
$$Z'(-2, -2) \quad Y'(-2, 4) \quad X'(2, 2)$$

Similarity, Midsegment, and Proportionality Review Name: _____

Use the diagram of $\triangle ABC$ where D, E, and F are the midpoints of the sides.

- $\overline{DE} \parallel \overline{BC}$
- $\overline{FE} \parallel \overline{BA}$
- If $AB = 14$, then $EF = \underline{7}$
- If $AE = 8$, then $DF = \underline{8}$
- If $DE = 4x + 5$, $BC = 12x - 2$, find $x = \underline{3}$, $BC = \underline{34}$

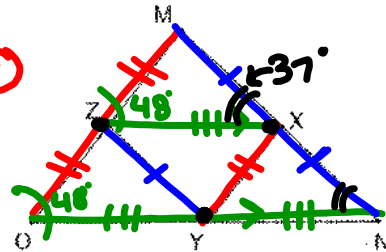
$$\begin{aligned} 2(4x+5) &= 12x-2 \\ 8x+10 &= 12x-2 \\ -8x & \quad -8x \\ \hline 10 &= 4x-2 \\ +2 & \quad +2 \\ \hline 12 &= 4x \\ \frac{12}{4} &= \frac{4x}{4} \\ 3 &= x \end{aligned}$$



Use the diagram of $\triangle MNO$ where X, Y, and Z are midpoints of the sides.

- If $YZ = 3x + 1$, and $MN = 10x - 6$ then $YZ = \underline{7}$
- If $YX = x - 1$, and $MO = 3x - 7$, then $MO = \underline{8}$
- If $m\angle MON = 48^\circ$, then $m\angle MZX = \underline{48^\circ}$
- If $m\angle MXZ = 37^\circ$, then $m\angle MNO = \underline{37^\circ}$

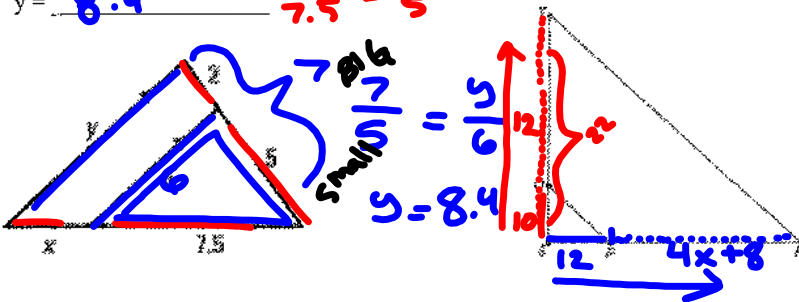
$$\begin{aligned} 2(3x+1) &= 10x-6 \\ 6x+2 &= 10x-6 \\ -6x & \quad -6x \\ \hline 2 &= 4x-6 \\ +6 & \quad +6 \\ \hline 8 &= 4x \\ \frac{8}{4} &= \frac{4x}{4} \\ 2 &= x \end{aligned}$$



14. Solve for the following.

$$\begin{aligned} x &= \underline{3} \\ y &= \underline{8.4} \end{aligned}$$

$$\begin{aligned} 15. \quad SQ = 10 ; ST = 22 ; SP = 12 ; PR = 4x + 8 \\ x &= \underline{8/5} , PR = \underline{14.4} \end{aligned}$$

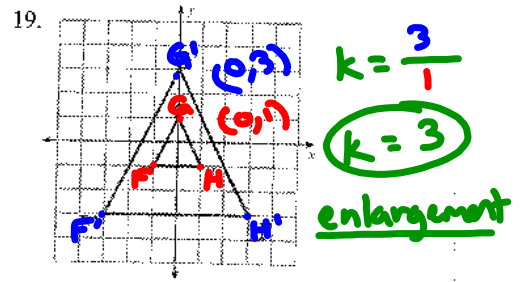
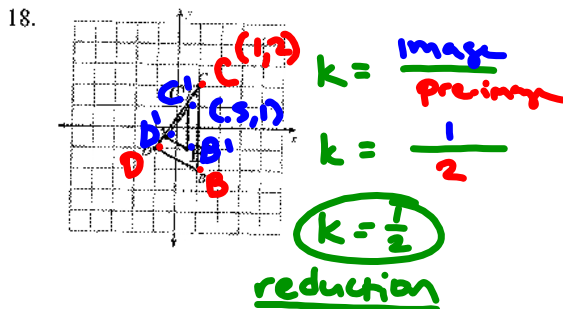


$$\begin{aligned} \frac{12}{4x+8} &= \frac{10}{12} \\ 144 &= 40x+80 \\ -80 & \quad -80 \\ \hline 64 &= 40x \\ \frac{64}{40} &= \frac{40x}{40} \\ x &= \underline{\frac{8}{5}} \end{aligned}$$

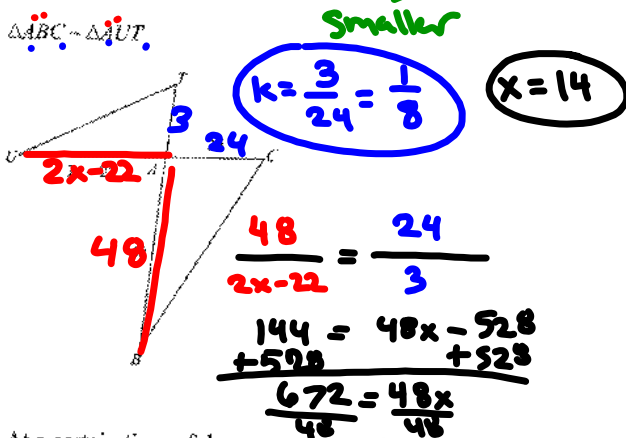
Identify the scale factor and tell if it is an enlargement or reduction.

16. $k = \frac{\text{image}}{\text{pre-image}} = \frac{5}{1} = 5$
enlargement

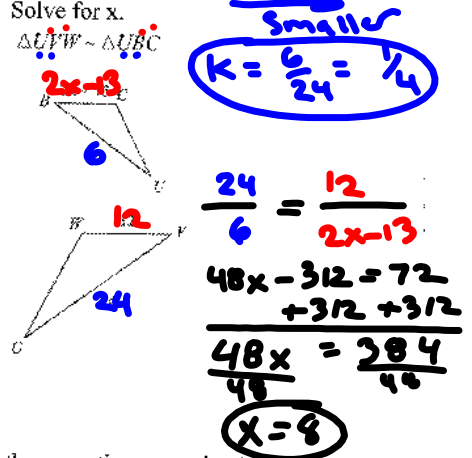
17. $k = \frac{-1}{2} = -\frac{1}{2}$
reduction



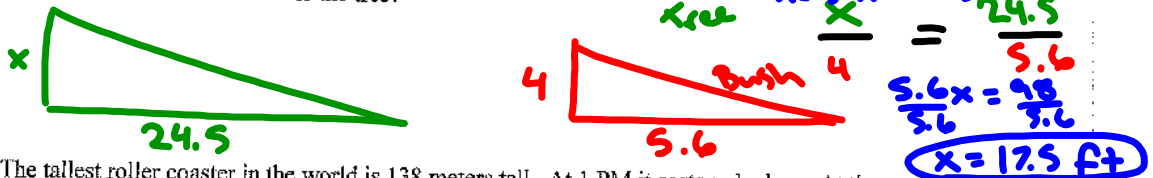
20. Identify the scale factor from ABC to A'UT.
 Solve for x.



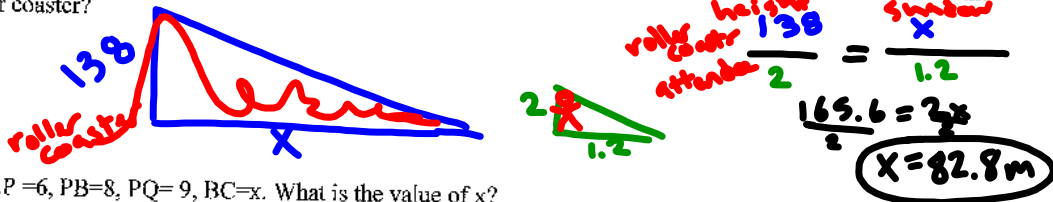
21. Identify scale factor UVW to UBC.
 Solve for x.



22. At a certain time of day a tree casts a shadow that is 24.5 ft long. At the same time a nearby 4 foot tall bush casts a 5.6 foot shadow. How tall is the tree?



23. The tallest roller coaster in the world is 138 meters tall. At 1 PM it casts a shadow. At the same time a park attendee waiting in line is 2 meters tall and their shadow is 1.2 meters long. How long is the shadow of the roller coaster?



24. AP = 6, PB = 8, PQ = 9, BC = x. What is the value of x?

BIG $\frac{14}{6} = \frac{x}{9}$
 Small
 $\frac{126}{6} = \frac{6x}{6}$
 $x = 21$

