Day 47

7-2 Similar Polygons

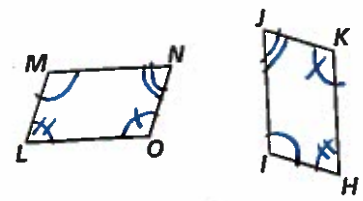
Two figures are similar if they have the same shape, but not necessarily the same size. * Dilations create similar shapes.

They are similar (~) if

1.) corresponding ∠'s are ≅

2.) corresponding sides are proportional
- the ratio of lengths of corresponding sides is the similarity ratio

***LMNO* ~ *HIJK*. Complete the proportions and congruence statements.**



7. $\angle M \cong$? ∠I

8. $\angle K \cong$? ∠O

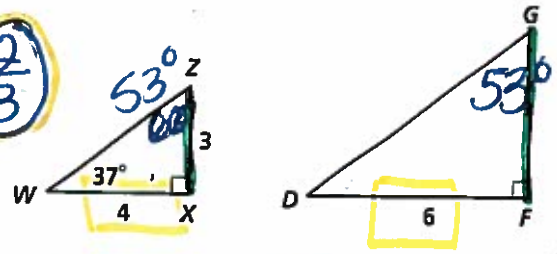
9. $\angle N \cong$? ∠J

10. $\frac{MN}{IJ} = \frac{NO}{JK}$

11. $\frac{HK}{LO} = \frac{HI}{LM}$

12. $\frac{IJ}{MN} = \frac{HK}{LO}$

$\triangle WXZ \sim \triangle DFG$. Use the diagram to find the following.



17. the similarity ratio of $\triangle WXZ$ and $\triangle DFG$

$\frac{WX}{DF} = \frac{XZ}{FG} = \frac{WZ}{DG}$

$\frac{4}{6} = \frac{2}{3}$

18. $m\angle Z$ 53°

19. DG

$\frac{2}{3} = \frac{5}{DG}$

$DG = 7.5$

20. GF = 4.5

$\frac{2}{3} = \frac{3}{GF}$

$3^2 + 4^2 = WZ^2$

$9 + 16 = WZ^2$

$\sqrt{25} = \sqrt{WZ^2}$

$5 = WZ$

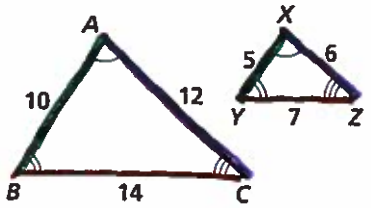
21. $m\angle G$ 53°

22. $m\angle D$ 37°

23. WZ 5

Are the polygons similar? If they are, write a similarity statement, and give the similarity ratio. If they are not, explain.

1.

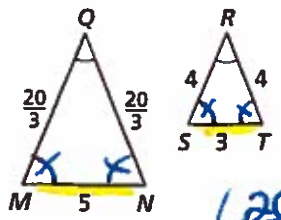


$\frac{10}{5} = \frac{12}{6} = \frac{14}{7}$

$2 = 2 = 2$

$\boxed{\text{yes}}$

2.

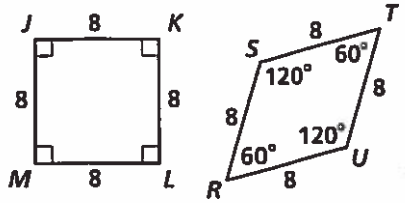


$\frac{\left(\frac{20}{3}\right)}{4} = \frac{5}{3} = \frac{\left(\frac{20}{3}\right)}{4}$

$1.\overline{6} = 1.\overline{6} = 1.\overline{6}$

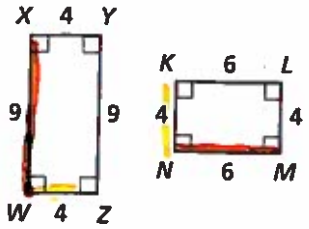
$\boxed{\text{yes}}$

4.



NO, corresponding ∠'s are not ≅

6.



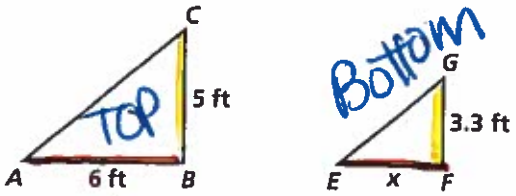
$\frac{9}{6} = \frac{4}{4} = \frac{9}{6} = \frac{4}{4}$

$\frac{3}{2} \neq 1$

NO

Algebra **The polygons are similar. Find the values of the variables.**

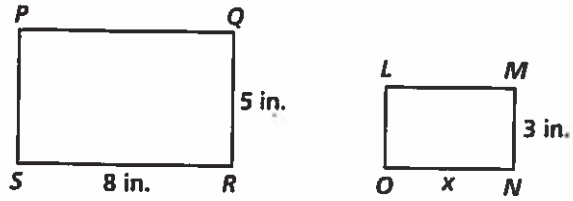
13.



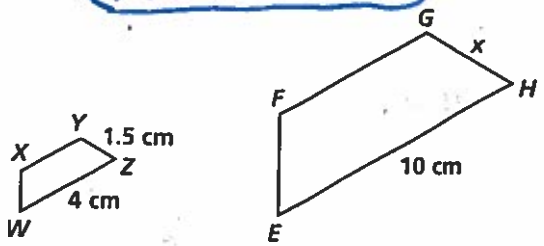
$\frac{6}{x} = \frac{5}{3.3}$

$\boxed{x = 3.96\text{ ft}}$

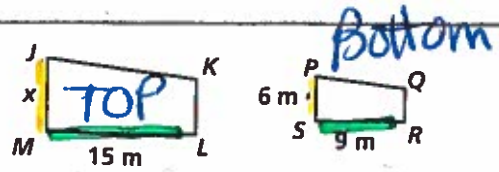
14.



15.



16.



$\frac{x}{6} = \frac{15}{9}$

A golden rectangle is a rectangle that can be divided into a square and a rectangle that is ~ to the original rectangle.

- in any golden rectangle, the length and width are in the golden ratio which is ≈ $\boxed{1.618:1}$

ex) He wants the canvas to be a golden rectangle with its longer horizontal sides 30cm wide. How high should the canvas be?

$$\frac{\text{longer}}{\text{shorter}} \quad \frac{30\text{cm}}{h} = \frac{1.618}{1} \quad \frac{\text{longer}}{\text{shorter}}$$

$$\boxed{h = 18.5\text{cm}}$$

p. 375 (1-19, 21-28, 31, 33, 52)

skip #17