

Lesson 7-2L: Similar Polygons & SSS~

Agenda

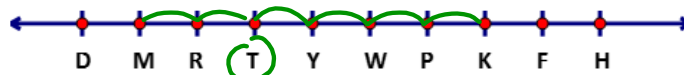
- Check & Review 7.1
- 7-2 Exploration and Guided Notes
- Need compass and ruler

Homework:

- Text p. 465 # 9, 10, 19, 20, 23, 24
- p. 475 # 3, 21, 25, 37
- CR#6 due Th. 2/16

PROBLEM SET 7-1

1. Determine the missing point.



- a) $D_{T,3}(Y) = (\quad)$ b) $D_{R, \frac{1}{2}}(F) = (\quad)$ c) $D_{P,4}(\quad) = (R)$
 d) $D_{H,3}(K) = (\quad)$ e) $D_{T,-2}(M) = (\mathbf{K})$ f) $D_{F, \frac{1}{8}}(\quad) = (K)$

***Negative means go the opposite direction from the center of dilation



from the center of dilation

2. Determine whether each of the following is a reduction or an enlargement:

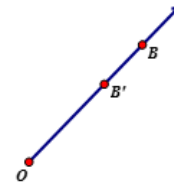
a) Scale Factor of 2:3
(image : pre-image)

Reduction or Enlargement

b) $D_{O, \frac{5}{3}}(G) = G'$

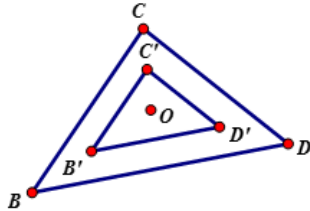
Reduction or Enlargement

c)



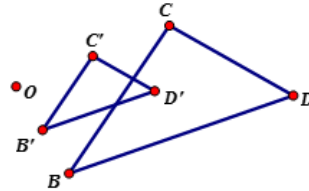
Reduction or Enlargement

d)



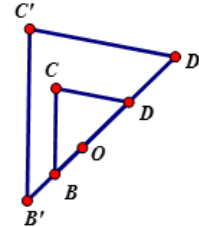
Reduction or Enlargement

e)



Reduction or Enlargement

f)



Reduction or Enlargement

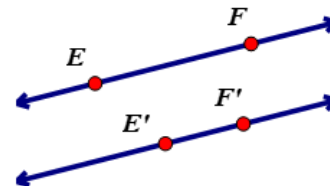
3. Given the dilation of \overline{EF} onto $\overline{E'F'}$,

a. Construct the center of dilation O

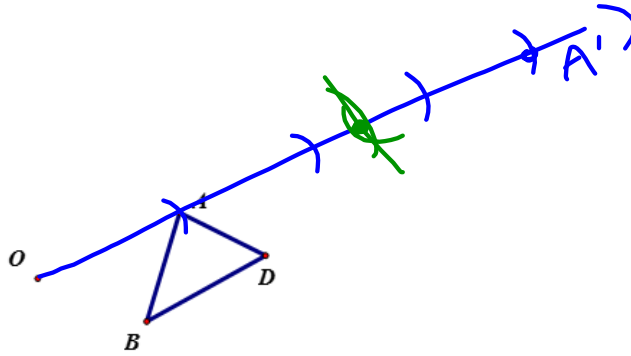
b. Using your compass, determine the scale factor $k = \frac{E'F'}{EF} = \text{---}$

c. Which of the following statements is false?

1. $\overline{EF} \parallel \overline{E'F'}$
2. $m\angle EFO = 2(m\angle E'F'O)$
3. $E'F' = \frac{1}{2}(EF)$
4. E and F remain collinear

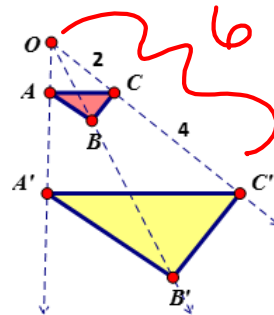


4. Construct the dilation centered at O of triangle ABD with $k=4$. (Extra credit: dilate again with $k=2.5$)

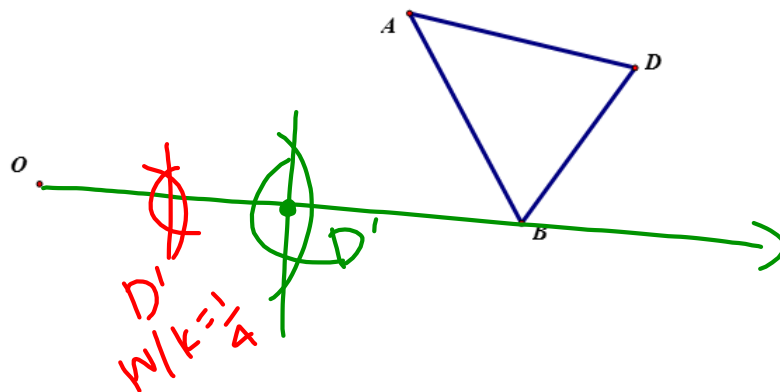


5. Tiffany sees this given dilation and claims that the scale factor is 2 because 4 is twice as big as 2. Is this a scale factor of 2? Explain.

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



6. Construct $D_{O, \frac{1}{4}}(\triangle ADB)$ (Extra credit: construct again with $k=1/4$)



Definition: Two polygons are similar if and only if their corresponding angles are congruent and their corresponding sides are proportional in the same similarity ratio.

Recall Scale Factor: $\frac{\text{Image}}{\text{Pre-image}}$ vs **Similarity Ratio:** $\frac{\text{Pre-image}}{\text{Image}}$

SIM RATIO $\frac{I}{II}$ $I \sim II$

MUST MATCH SIM STATEMENT

Given the following triangles, measure and record the following information using a ruler (in centimeters) and your universal angle maker. Then determine if the triangles are similar by definition. If so, write the similarity statement and identify the similarity ratio.

AB = _____	DE = _____
BC = _____	EF = _____
CA = _____	FD = _____
m∠A = _____	m∠D = _____
m∠B = _____	m∠E = _____
m∠C = _____	m∠F = _____

Compare the angles. Are they congruent? How does this set up your correspondence?

$\triangle ABC \text{ CORR } \triangle FDE$

Compare the sides. Are they proportional?

$\frac{\Delta I}{\Delta II} : \frac{AB}{FD} = \frac{3}{6} = \frac{1}{2}$

$\frac{\Delta I}{\Delta II} : \frac{BC}{DE} = \frac{3.7}{7.4} = \frac{1}{2}$

$\frac{\Delta I}{\Delta II} : \frac{CA}{EF} = \frac{4}{8} = \frac{1}{2}$

Write the similarity statement for the triangles: $\triangle ABC \sim \triangle FDE$ $\Delta I \sim \Delta II$

State the similarity ratio which corresponds with your similarity statement: $\frac{\Delta I}{\Delta II} : \frac{1}{2}$

What measurements did you take when determining if the previous triangles were similar? Are their certain criteria (like triangle congruency criteria) that we can use to avoid having to compare all the corresponding sides and angles?

Triangle Similarity Criteria: SSS~

Since dilations preserve angle measures, can just proportional sides guarantee similar triangles? Recall our constructed dilation, how were all the corresponding pre-image and image sides related?

$\Delta I \sim \Delta II$
SSS~

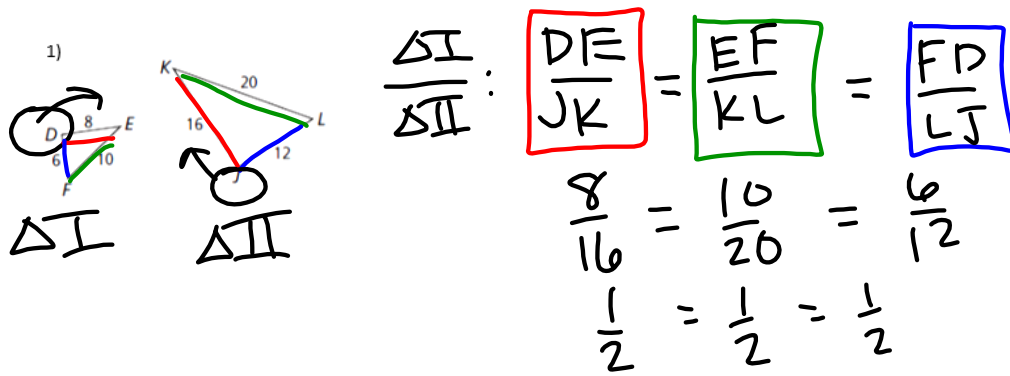
$\frac{\Delta I}{\Delta II} : \frac{AB}{A'B'} = \frac{BC}{B'C'} = \frac{CA}{C'A'}$

SIM RATIO → SCALE FACTOR → DILATION WHICH PRESERVES MEASURE

Side-Side-Side (SSS) Similarity	If the three sides of one triangle are proportional to the three corresponding sides of another triangle, then the triangles are similar.	<p>$\triangle ABC \sim \triangle DEF$</p>
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DETERMINING SSS~ CRITERIA

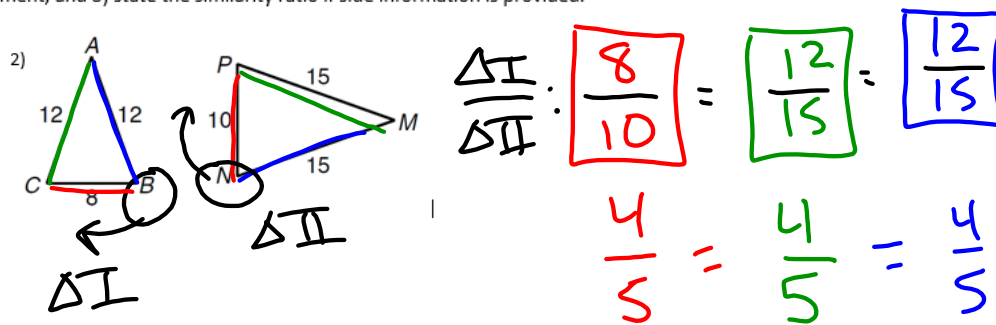
Identify if the sets of triangles meet triangle similarity criteria. If so, 1) state which criteria is met and 2) write a similarity statement, and 3) state the similarity ratio if side information is provided.



Criteria: SSS~
 Statement: $\triangle DEF \sim \triangle JKL$
 Similarity Ratio: $\frac{\Delta I}{\Delta II} : \frac{1}{2}$

DETERMINING SSS~ CRITERIA

Identify if the sets of triangles meet triangle similarity criteria. If so, 1) state which criteria is met and 2) write a similarity statement, and 3) state the similarity ratio if side information is provided.

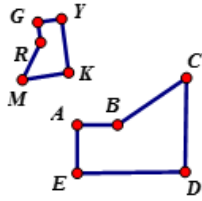


Criteria: SSS~
 Statement: $\triangle BCA \sim \triangle NPM$
 Similarity Ratio: $\frac{4}{5}$

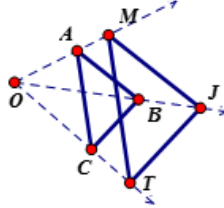
WRITING PROPORTIONS WITH SIMILAR POLYGONS

3) The two figures in each question are similar. Create the similarity statement from the diagram.

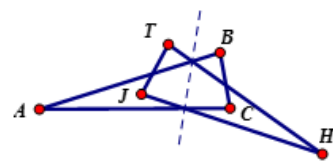
a) Pentagon GYKMR ~ _____



b) $\triangle JMT \sim$ _____



c) $\triangle BAC \sim$ _____



4) Pentagon ABCDE is similar to Pentagon RYMNT. Complete the following.

$\angle C \cong \angle$ M

$\angle T \cong \angle$ E

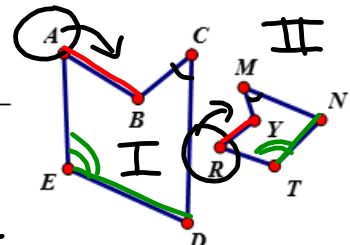
$\frac{AB}{RY} = \frac{ED}{NT}$ I

$\frac{NT}{DE} = \frac{RT}{AE}$ I

SCALE FACTOR

$\frac{MN}{RT} = \frac{CD}{\square}$

$\frac{AB}{B} = \frac{RY}{\square}$



$\frac{1}{3} = \frac{3}{9}$
 $\frac{3}{9} = \frac{1}{3}$
 ~~$\frac{3}{3} = \frac{1}{1}$~~

5) Given that $\triangle AFG \sim \triangle DRH$. Draw a picture and complete the following:

$$\angle H \cong \angle \underline{\hspace{2cm}} \quad \frac{DR}{AF} = \frac{DH}{\square} \quad \underline{\hspace{2cm}}$$

$$\angle D \cong \angle \underline{\hspace{2cm}} \quad \frac{\square}{RH} = \frac{AG}{DH} \quad \underline{\hspace{2cm}}$$

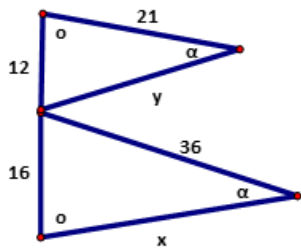
6) $\triangle ABC$ is similar to another triangle. Provided is some information about the two triangles, $\frac{BC}{DR} = \frac{AB}{TD}$.

From this information determine the triangle similarity statement.

$$\triangle ABC \sim \triangle \underline{\hspace{2cm}}$$

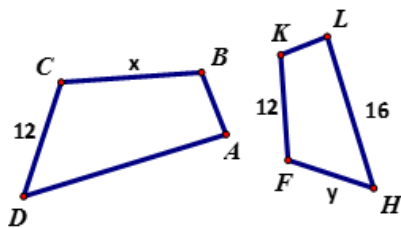
DETERMINING MISSING SIDE LENGTHS

7) Given that the triangles are similar, solve for x and y :



8) Given that the polygons are similar with the given similarity ratio, determine x and y :

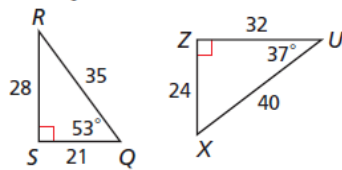
CBAD : FKLH is 3:2



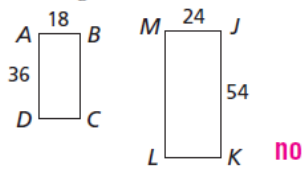
Multi-Step Determine whether the polygons are similar. If so, write the similarity ratio and a similarity statement.

9. $\triangle RSQ$ and $\triangle UXZ$

9. yes; $\frac{7}{8}$;
 $\triangle RSQ \sim \triangle UXZ$



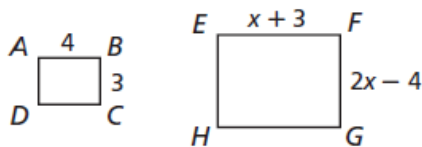
10. rectangles $ABCD$ and $JKLM$



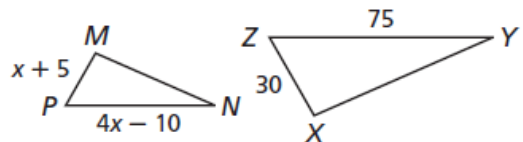
no

Find the value of x .

19. $ABCD \sim EFGH$ 5



20. $\triangle MNP \sim \triangle XYZ$ 15



23. $\square JKLM \sim \square NOPQ$. If $m\angle K = 75^\circ$, name two 75° angles in $\square NOPQ$. $\angle O; \angle Q$

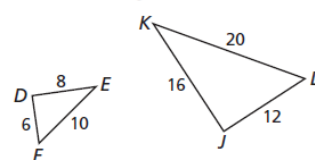
24. A dining room is 18 ft long and 14 ft wide. On a blueprint for the house, the dining room is 3.5 in. long. To the nearest tenth of an inch, what is the width of the dining room on the blueprint? 2.7 in.

Draw $\triangle JKL$ and $\triangle MNP$. Determine if you can conclude that $\triangle JKL \sim \triangle MNP$ based on the given information. If so, which postulate or theorem justifies your response?

21. $\frac{JK}{MN} = \frac{KL}{NP} = \frac{JL}{MP}$
 yes; SSS ~

Verify that the triangles are similar.

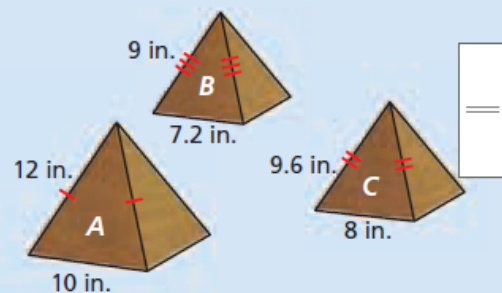
3. $\triangle DEF$ and $\triangle JKL$



25. This problem will prepare you for the Multi-Step Taks Prep on page 478.

The set for an animated film includes three small triangles that represent pyramids.

- Which pyramids are similar? Why?
- What is the similarity ratio of the similar pyramids? $\frac{5}{4}$



37. **Gridded Response** If 6, 8, and 12 and 15, 20, and x are the lengths of the corresponding sides of two similar triangles, what is the value of x ? 30