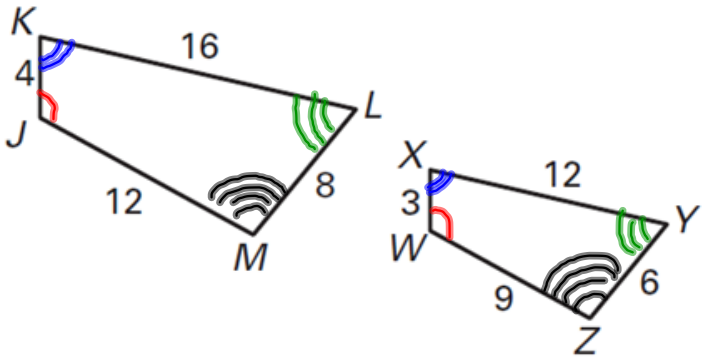
# SM2 Unit 10 -- Similarity and Proportionality Review




**In the diagram to the right, *JKLM* ~ *WXYZ*.**

1. List all pairs of congruent angles.

$\angle J \cong \angle W$ $\angle L \cong \angle Y$
$\angle K \cong \angle X$ $\angle M \cong \angle Z$

2. Write the ratios of the corresponding sides in a statement of proportionality.

$\frac{JK}{WX} = \frac{KL}{XY} = \frac{LM}{YZ} = \frac{MJ}{ZW}$

3. What is the scale factor of *WXYZ* to *JKLM*?

Since WXYZ is mentioned first, it is the numerator, and JKLM is the denominator.

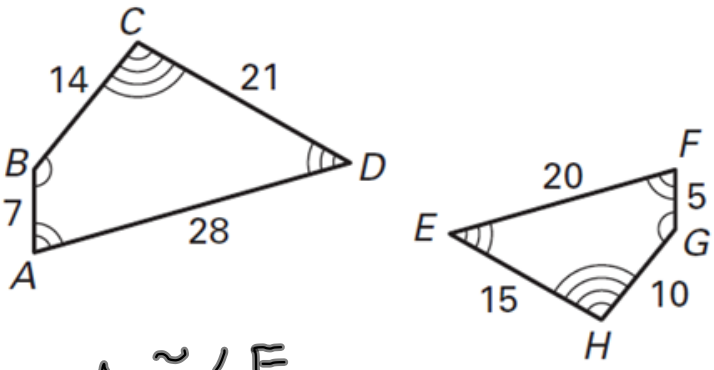
$$\frac{WX}{JK} = \frac{3}{4}$$

The scale factor is $\frac{3}{4}$.

This meaning WXYZ is $\frac{3}{4}$ as big as JKLM.

**Use the figure to the right to answer question 4.**

4. Determine whether the polygons are similar. (Show your work!) If they are, write a similarity statement and find the scale factor of the larger polygon to the smaller polygon.




$\angle A \cong \angle F$
$\angle B \cong \angle G$
$\angle C \cong \angle H$
$\angle D \cong \angle E$

write sides of ABCD from smallest to largest.

$\frac{7}{5} \quad \frac{14}{10} \quad \frac{21}{15} \quad \frac{28}{20}$

write sides of EFGH from smallest to largest.

$\frac{7}{5} = \frac{14}{10} = \frac{21}{15} = \frac{28}{20}$
$1.4 \quad 1.4 \quad 1.4 \quad 1.4$

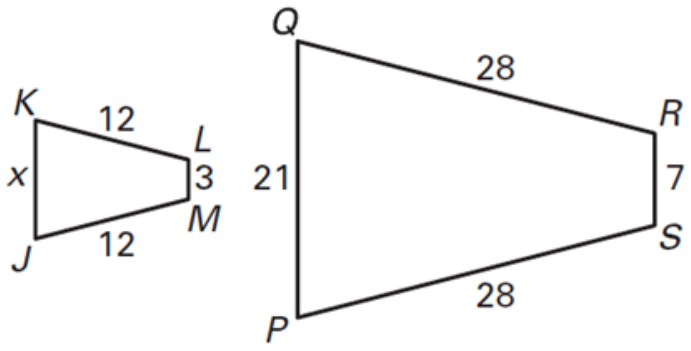
So yes they are similar

Similarity statement is $\overline{ABCD \sim FGHE}$

The scale factor is $\frac{7}{5}$ or 1.4

**Find the value of $x$.**

5. $JKLM \sim PQRS$

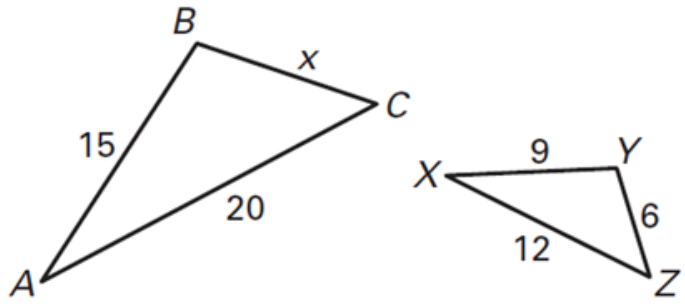



$\frac{JK}{PQ} = \frac{LM}{RS}$ so $\frac{x}{21} = \frac{3}{7}$

$7x = 63$

$\boxed{x = 9}$

6. $\triangle ABC \sim \triangle XYZ$



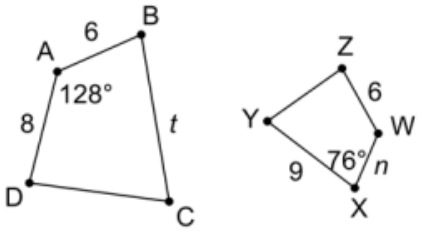

$\frac{BC}{YZ} = \frac{AB}{XY}$

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

$9x = 90$

$\boxed{x = 10}$

**In the figure below, ABCD ~ WXYZ. Answer the following questions.**




7. What is $m\angle B$?

$\angle B \cong \angle X$

so $\angle B = 76°$

8. What is $m\angle W$?

$\angle W \cong \angle A$

so $m\angle W = 128°$

9. What is the scale factor of ABCD to WXYZ?

$\frac{AB}{WX} = \frac{BC}{XY} = \frac{CD}{YZ} = \frac{AD}{WZ}$

↑ must use this one.

$\frac{8}{6} = \frac{4}{3}$

10. Find the value of $n$.

$\frac{AB}{WX} = \frac{AD}{WZ}$

$\frac{6}{n} = \frac{8}{6}$

$36 = 8n$

$\frac{36}{8} = \frac{8n}{8}$

$4.5 = n$

11. Find the value of $t$.

$\frac{BC}{XY} = \frac{AD}{WZ}$

$\frac{t}{9} = \frac{8}{6}$

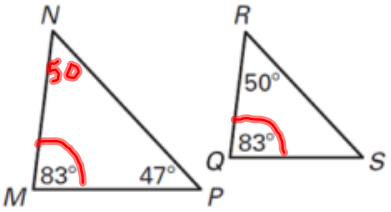
$6t = 72$

$\frac{6t}{6} = \frac{72}{6}$

$t = 12$

**Determine whether the triangles are similar (Show your work!). If they are similar, write a similarity statement and state which postulate or theorem (AA, SAS, or SSS) justifies your answer.**

12.




$\angle M \cong \angle Q$

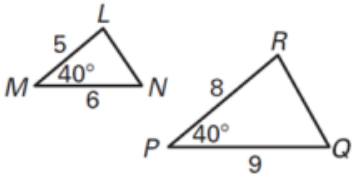
$\angle N = 180° - 83° - 47°$

$m\angle N = 50°$

$\angle N \cong \angle R$

AA ~ $\triangle MNP \sim \triangle QRS$

13.



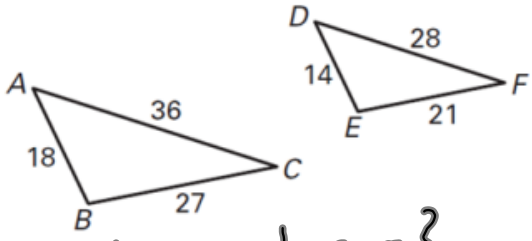

$\angle M \cong \angle P$

$\frac{5}{8} \neq \frac{6}{9}$

$.625 \neq .667$

not similar

14.




Are these ratios =?

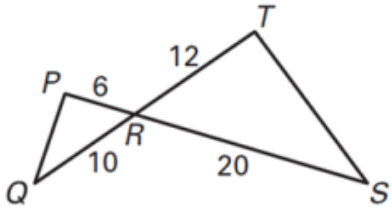
$\frac{18}{14} \quad \frac{27}{21} \quad \frac{36}{28}$

1.285 1.285 1.285

yes - SSS ~

$\triangle ABC \sim \triangle DEF$

15.




$\angle PRQ \cong \angle TRS$

vertical angles

are these ratios =?

$\frac{6}{12} = \frac{10}{20}$

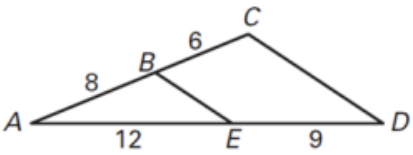
$.5 = .5$ yes

SAS ~

$\triangle PRQ \sim \triangle TRS$

**Draw the overlapping triangles separately. Show that they are similar. State which postulate or theorem you would use to prove they are similar (AA, SAS, or SSS). Then write a similarity statement.**

16.







① cannot use SSS~ because we do not have 3 sides of each triangle.

② We cannot use AA~ because we do not have 2 angles.

So try SAS

$\angle A \cong \angle A$ ← There's our angle

Are the side ratios the same?

$\frac{8}{14} \quad \frac{12}{21}$

simplied

$\frac{4}{7} = \frac{4}{7}$

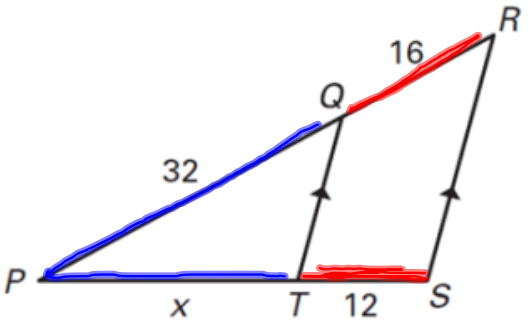
or $.571 = .571$

The triangles are similar by SAS~

Similarity statement is $\triangle ABE \sim \triangle ACD$

**Find the value of the variable.**

17.



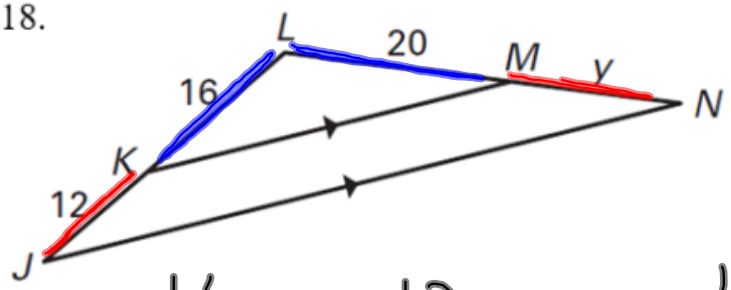

$\frac{32}{x} = \frac{16}{12}$

$16x = 32(12)$

$16x = 384$

$\boxed{x = 24}$

18.



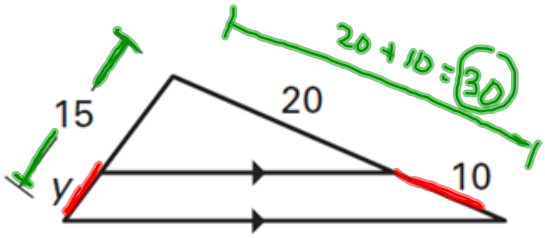

$\frac{16}{20} = \frac{12}{y}$ or $\frac{16}{12} = \frac{20}{y}$

$16y = 20(12)$

$16y = 240$

$\boxed{y = 15}$

19.

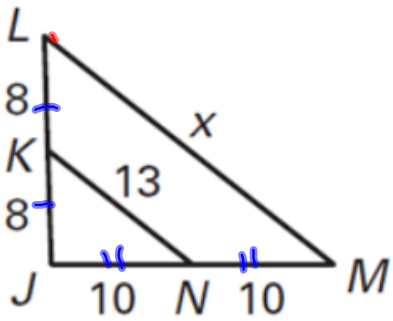



$\frac{15}{y} = \frac{30}{10}$

$150 = 30y$

$\boxed{5 = y}$

20.




KN is a midsegment

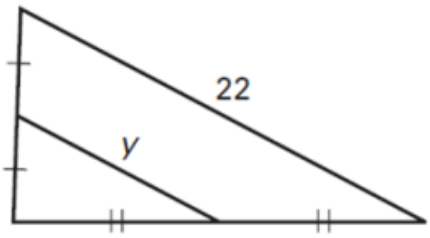
$KN = \frac{1}{2} LM$

$2(KN) = LM$

$2(13) = LM$

$\boxed{26 = LM}$

21.

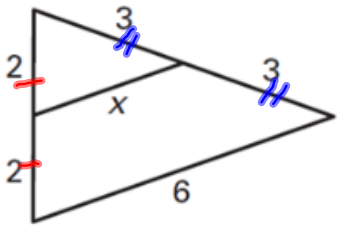



y is midsegment length

$y = \frac{1}{2}(22)$

$\boxed{y = 11}$

22.



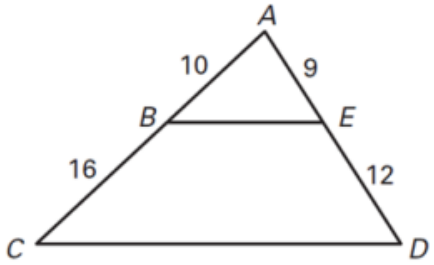

x is midsegment length

$x = \frac{1}{2}(6)$

$\boxed{x = 3}$

**Determine whether $\overline{BE} \parallel \overline{CD}$. Show some work to justify your answer.**

23.



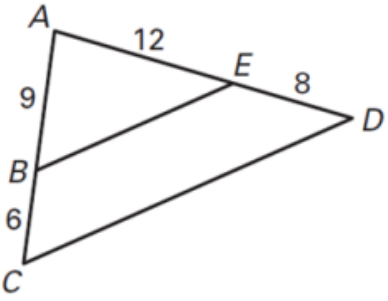

is $\frac{10}{16} \stackrel{?}{=} \frac{9}{12}$

$10(12) = 9(16)$

$120 \neq 144$

not parallel

24.




is $\frac{9}{6} = \frac{12}{8}$

$9(8) = 6(12)$

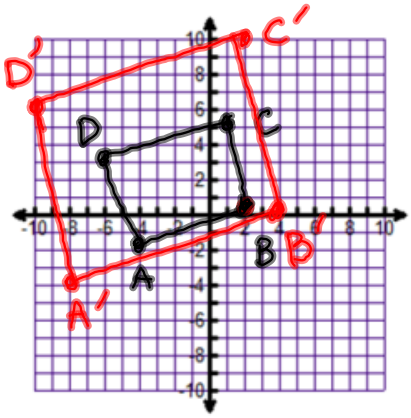
$72 = 72$

yes parallel

From section 10.2

X 3. Graph and label the parallelogram with vertices A(–4, –2), B(2, 0), C(1, 5) and D(–5, 3), then dilate the parallelogram by a factor of 2 and a center at (0, 0). Label the new vertices A′, B′, C′ and D′. What are the coordinate of the new vertices?

MULTIPLY each coordinate by 2.

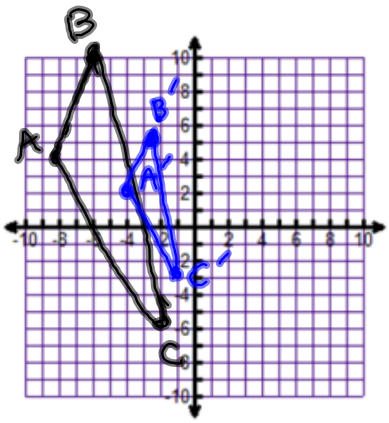



A′ (−8, −4) B′ (4, 0) C′ (2, 10) D′ (−10, 6)

## Section 10.2

~~6~~. Graph and label the triangle with vertices A(–8, 4), B(–5, 10), and C(–2, –6), then dilate the triangle by a factor of ½ and a center at (0, 0). Label the new vertices A′, B′ and C′. What are the coordinate of the new vertices?

MULTIPLY EACH coordinate by $\frac{1}{2}$.




A′ ( -4, 2 ) B′ ( $-\frac{5}{2}$, 5 ) C′ ( -1, -3 )

-2.5