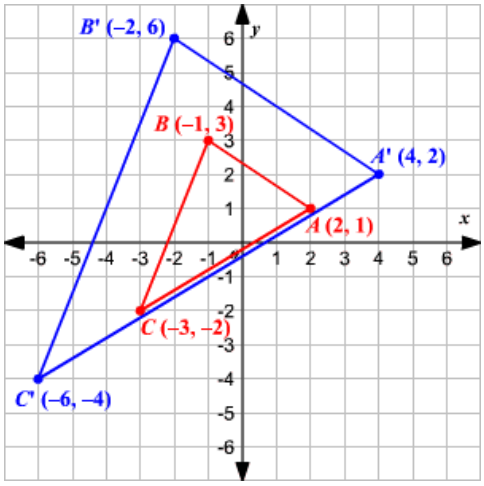
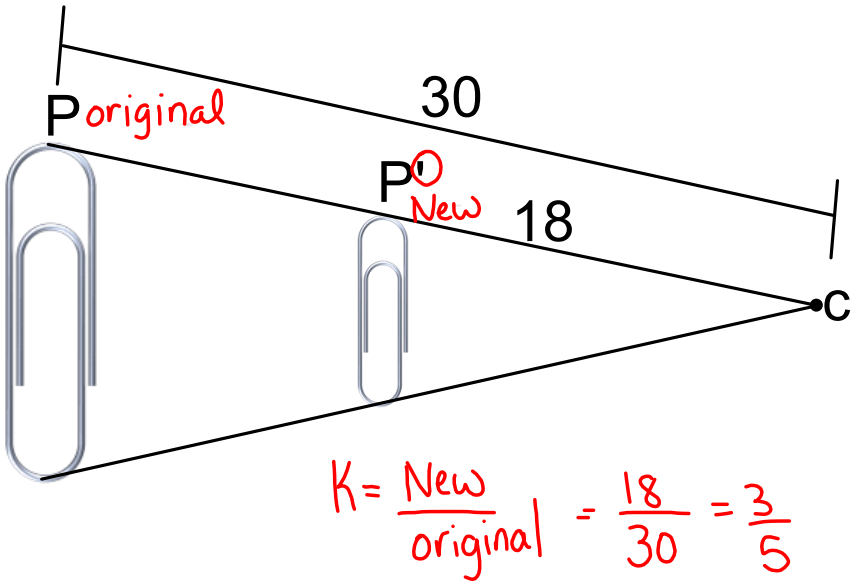
Unit 12.1
Dilations, Transformations, and triangle similarity



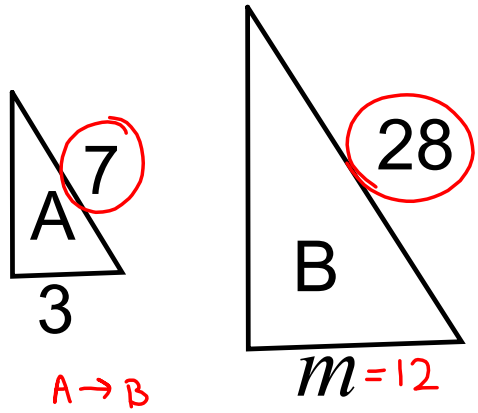
I can:_____

Dilation: Indicate **reduction or enlargement** and **scale factor**



$K = \frac{New}{original} = \frac{18}{30} = \frac{3}{5}$

Dilation: Indicate **reduction or enlargement** from figure A to figure B, then find m

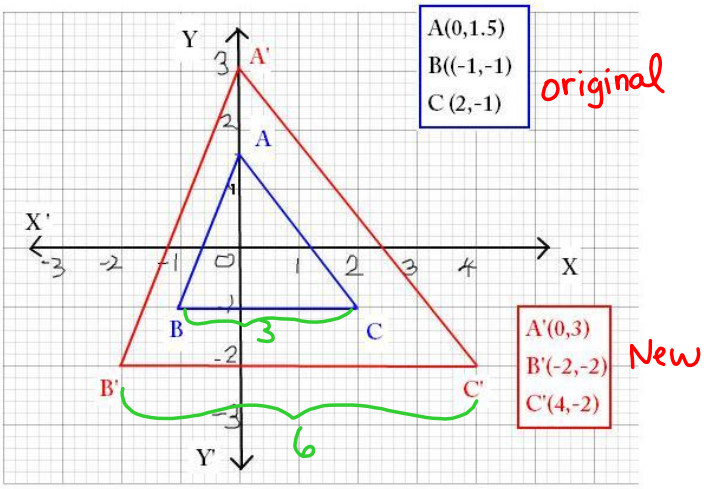


$K = \frac{28}{7} = \frac{4}{1} = 4$

A → B

enlargement

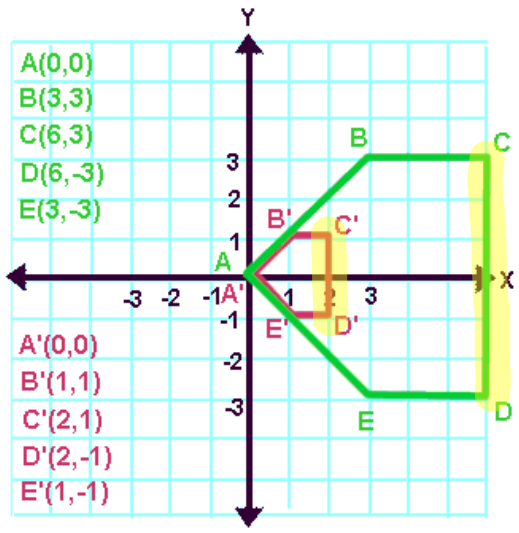
Dilation: Indicate **reduction or enlargement** and **scale factor**



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

What is the scale factor?

Is this an example of a reduction or an enlargement?

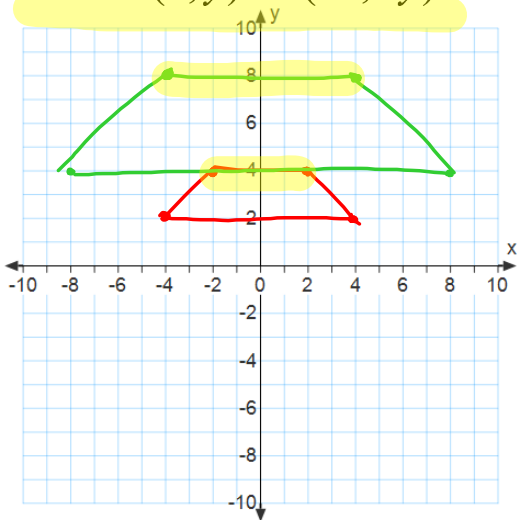


Reduction

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

Graph ⏢ABCD with vertices A(-2,4) B(2,4), C(4,2), D(-4,2)
What are the coordinates for A', B', C', D'?

Dilation: $(x, y) \rightarrow (2x, 2y)$



original	New
A (-2,4)	A' (-4, 8)
B(2,4)	B' (4, 8)
C(4,2)	C' (8, 4)
D(-4,2)	D' (-8, 4)

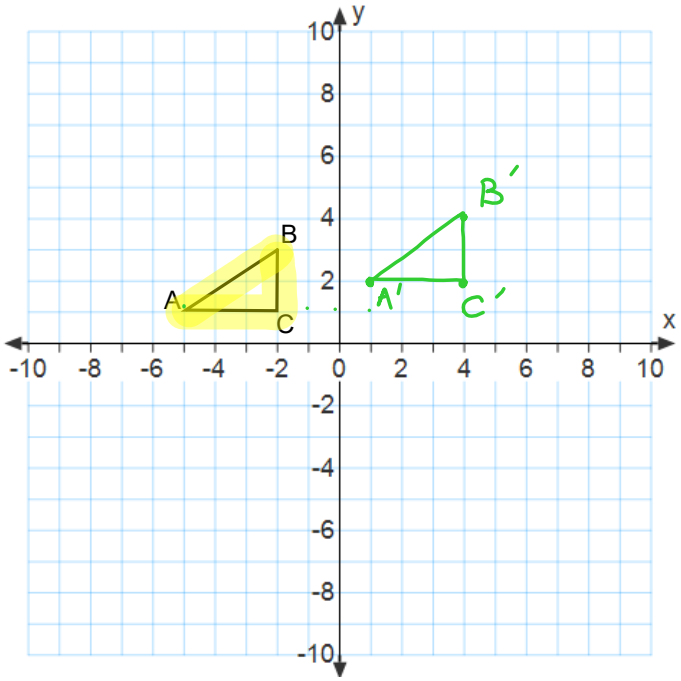
Given ▱ABCD with vertices A(-6,6) B(-1,6), C(1,3), D(-4,3).

Dilation: $(x,y) \rightarrow (\frac{1}{3}x, \frac{1}{3}y)$

New vertices?

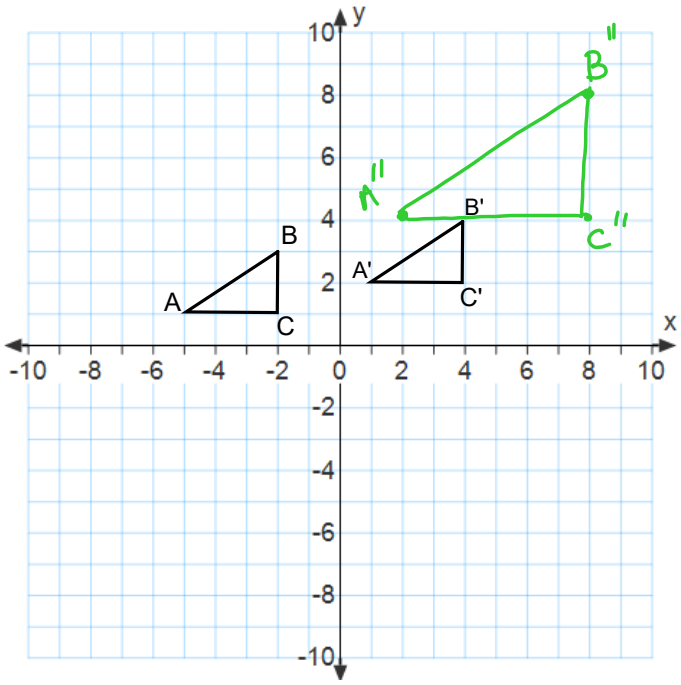
A′ (-2, 2)
B′ (-⅓, 2)
C′ (⅓, 1)
D′ (-4⅓, 1)

Translate △ABC 6 units right and 1 unit up



Translate △ABC 6 units right and 1 unit up

Dilate △A'B'C' by a scale factor of 2



A′(1,2) A″(2,4)
B′(4,4) B″(8,8)
C′(4,2) C″(8,4)

Given △ABC with points: A(4,1), B(3,-2), C(-4,-2)

Dilation: $(x, y) \rightarrow (2x, 2y)$

Translation: $(x, y) \rightarrow (x-3, y+2)$

left 3 up 2

A(4,1) A′ (2x,2y) (8,2) A″ (-3,2) (5,4)

B(3,-2) B′(6,-4) B″(3,-2)

C(-4,-2) C′(-8,-4) C″(-11,-2)

Given $\triangle ABC$ with points: A(4,1), B(3,-2), C(-4,-2)

Translation: $(x, y) \rightarrow (x+2, y-3)$

Right 2 down 3

Dilation: $(x, y) \rightarrow (4x, 4y)$

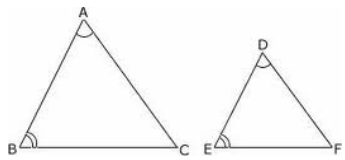
K = 4

(2,-3) (4x, 4y)

A (4,1) A′ (6,-2) A″ (24,-8)

B (3,-2) B′ (5,-5) B″ (20,-20)

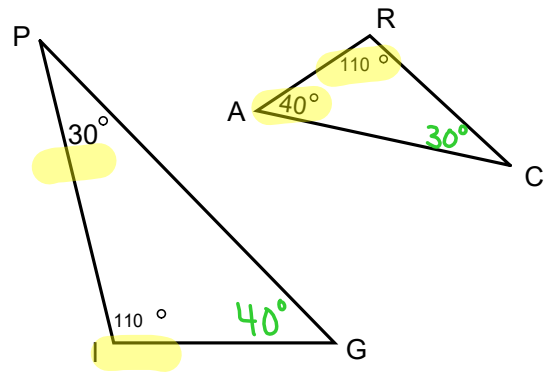
C (-4,-2) C′ (-2,-5) C″ (-8,-20)



Angle-Angle Similarity Postulate (AA ~)

If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.

1. Are the two triangles similar? If they are write the similarity statement.



$\triangle PGI \sim \triangle CAR$

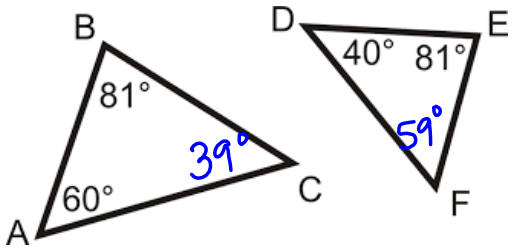
$\overline{PG} \sim \overline{CA}$

$\overline{GI} \sim \overline{AR}$

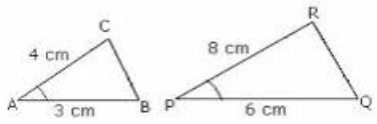
$\overline{IP} \sim \overline{RC}$

2. Are the two triangles similar? If they are write

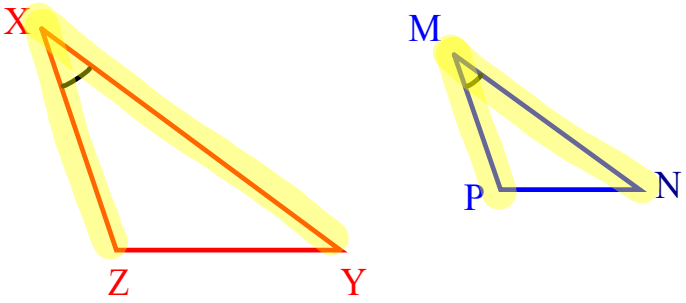
the similarity statement.



Side-Angle-Side (SAS) Similarity Theorem

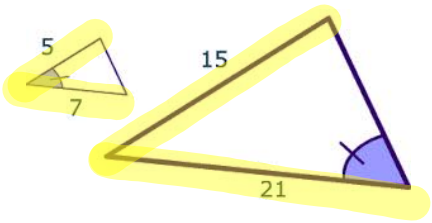


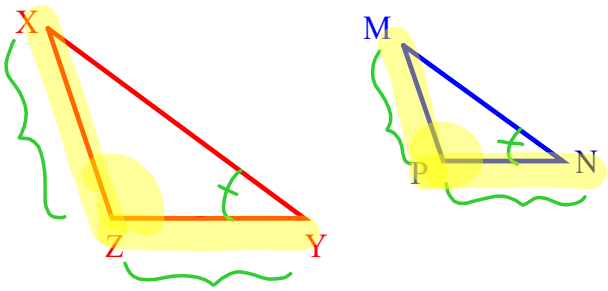
If an angle of one triangle is congruent to an angle of a second triangle and the lengths of the sides including these angles are proportional, then the triangles are similar.



If $\angle X \cong \angle M$ and $\frac{ZX}{PM} = \frac{XY}{MN}$, then $\Delta XYZ \sim \Delta MNP$

This is not an example of SAS Similarity. Why not?





1. If angle Y is ≅ to angle N, which 2 sides need to be proportionate for the triangles to be similar by SAS?

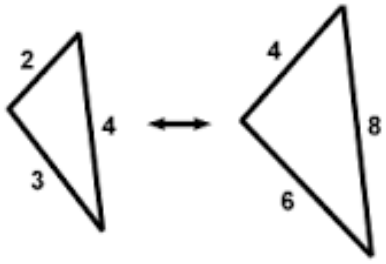
$\frac{ZY}{PN} = \frac{XY}{MN}$

2. If $\frac{XZ}{MP} = \frac{ZY}{PN}$, which 2 angles need to be for the triangles to be similar by SAS?

$\angle Z \cong \angle P$

Side-Side-Side (SSS) Similarity Theorem

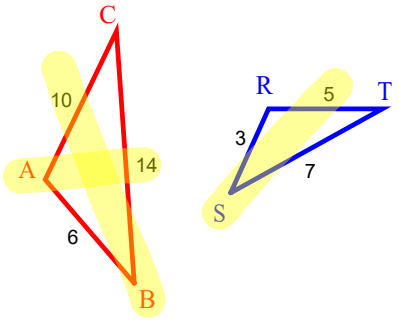
If the corresponding side lengths of two triangles are proportional, then the triangles are similar.



Are the two triangles similar?

If they are write the similarity statement.

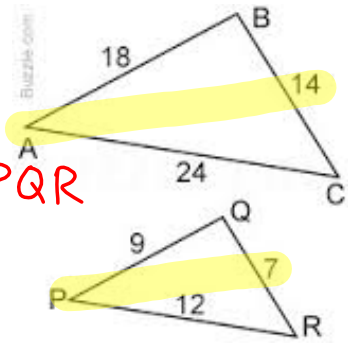
$\Delta ABC \sim \Delta RST$



$\frac{6}{3} = \frac{10}{5} = \frac{14}{7}$

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

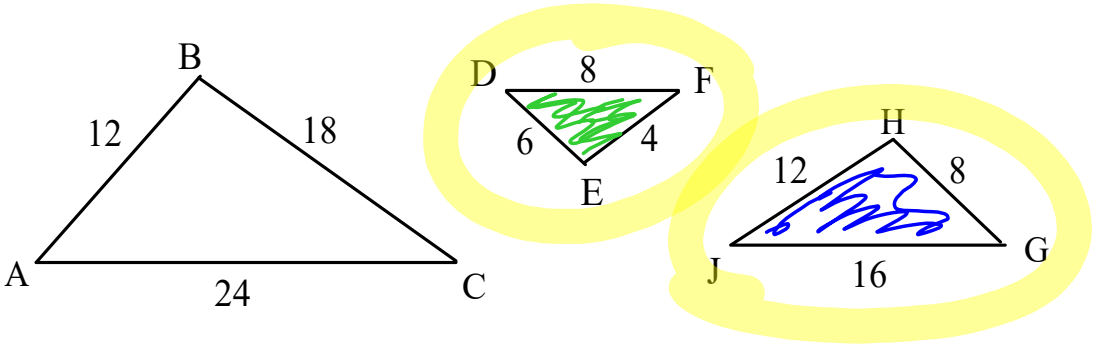
$\Delta ABC \sim \Delta PQR$



$\frac{14}{7} = \frac{18}{9} = \frac{24}{12}$

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

Which triangle is similar to ΔABC?



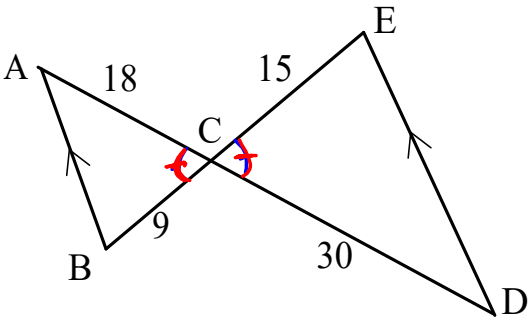
$\frac{12}{4} = \frac{18}{6} = \frac{24}{8}$

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

$\frac{12}{8} = \frac{18}{12} = \frac{24}{16}$

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

Name 2 different methods you would use to show that the triangles are similar.



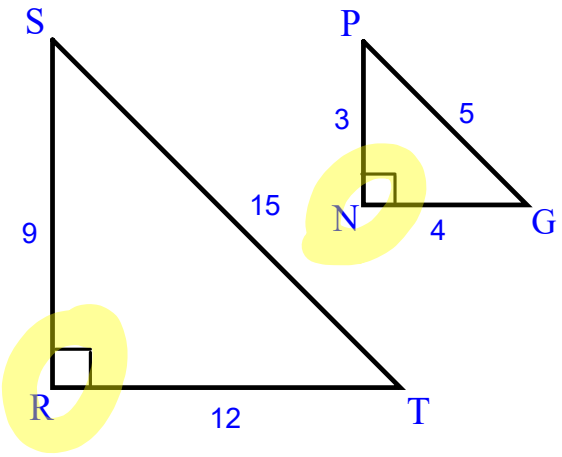
AA ~ alternate int. ∠ ≅

SAS ~ vertical ∠'s
proportional sides

$\frac{18}{30} = \frac{9}{15}$

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

State what method you would use to show that the triangles are similar.



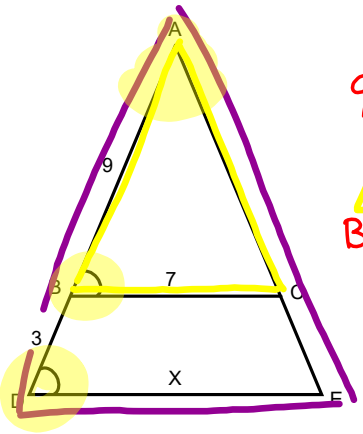
SSS ~

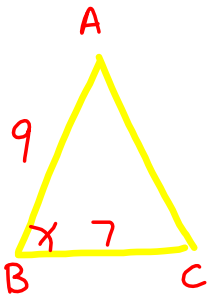
$\frac{9}{3} = \frac{12}{4} = \frac{15}{5}$

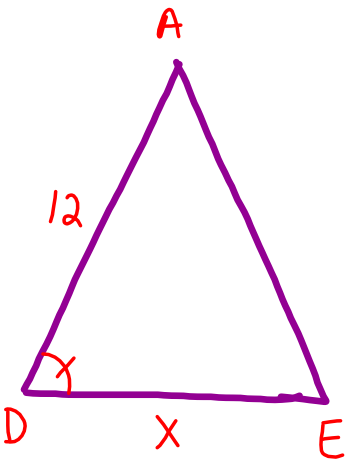
$\frac{3}{1} = \frac{3}{1} = \frac{3}{1}$

SAS ~

Is there enough information to find the value of x? If so , find the value of x.



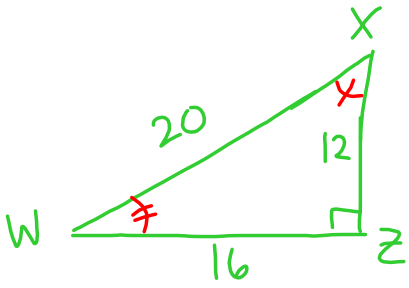


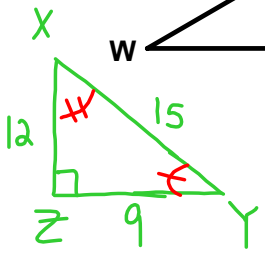


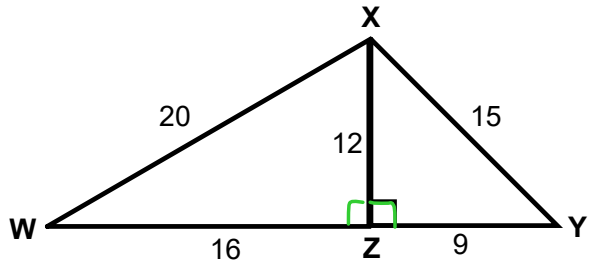
$\frac{9}{12} = \frac{7}{x}$ $9x = 84$

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

Is $\triangle XZW \sim \triangle YZX$?







$\frac{12}{9} = \frac{16}{12} = \frac{20}{15}$

$\frac{4}{3} = \frac{4}{3} = \frac{4}{3}$ SSS