Unit 10 Similarity and Transformations

Guided Notes

KEY

Name

Period

If found, please return to Mrs. Brandley's room, M-8.

Concept 1: Dilations

Dilation: a reduction or enlargement that is proportional

Enlargement: a dilation that gets bigger k > 1

Reduction: a dilation that gets smaller k < 1

Scale Factor: how much bigger or smaller (k)

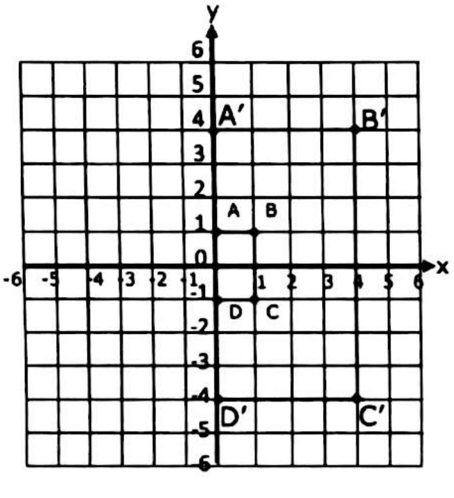
Center of Dilation: where the dilation originates

State whether the following dilations are a reduction or an enlargement based on their scale factor(k):

k=3	k=1/3	k=3/2	k=.67
enlargement	reduction	enlargement	reduction

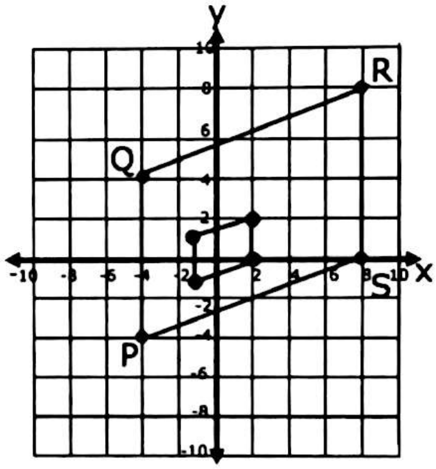
Determine whether the dilation is a reduction or an enlargement. Then find it's scale factor.

From Orange to Blue



Scale Factor, K= 4

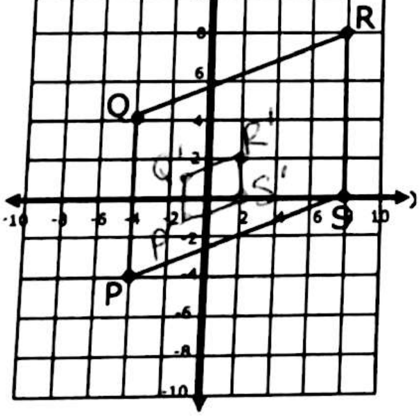
From Green to Purple



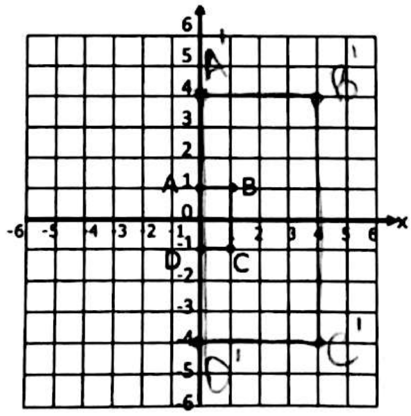
Scale Factor, K= 1/4

Draw the shape after a dilation with the given scale factor:

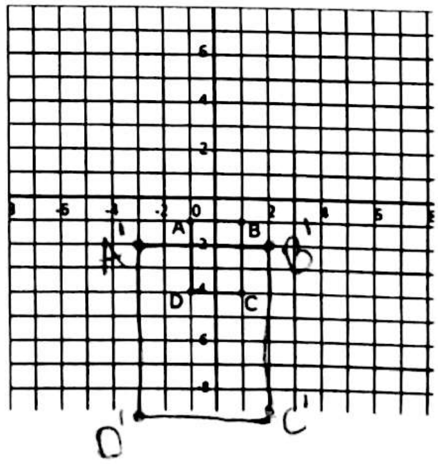
K=1/4



K=4



K=2



Point T is a vertex of a triangle. Point M is the image or T after the dilation. Find the scale factor k of the dilation.

1. T (1 , 5) and M (2 , 10)

K= 2

2. T (4 , 8) and M (2 , 4)

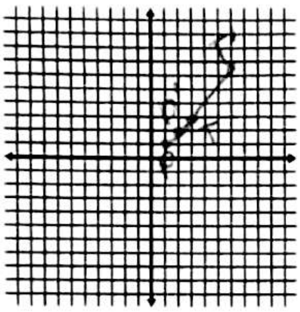
K= 1/2

3. T (-3 , -6) and M (-15 , -~~18~~) -30

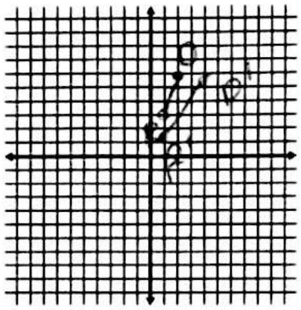
K= 5

A line segment has the given endpoints. Use the scale factor to write the ordered pair after the dilation. (Center of Dilation is at (0,0))

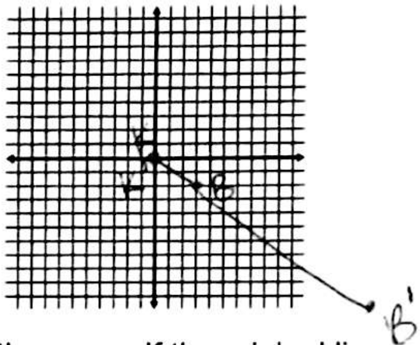
4. P(1,1), T(3,3) and k = 2



5. R(1,3), D(2,5), and k = 3/4



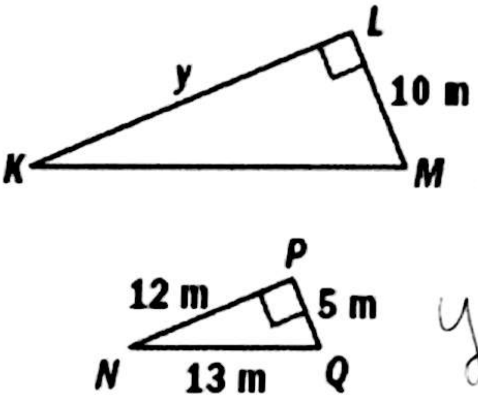
6. K(0,0), B(3,-2), and k = 5



NOTE: When the original line passes through the origin, the image stays the same. If the original line does not pass through the origin, it is parallel to the original line.

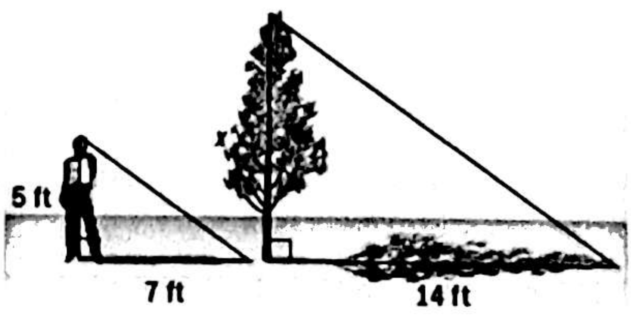
You can determine the center of dilation of by drawing straight lines between the corresponding points of the shapes and seeing where they intersect. This intersection point is the center of dilation.

Find the missing side length(s) of the following dilated shapes:



K=2

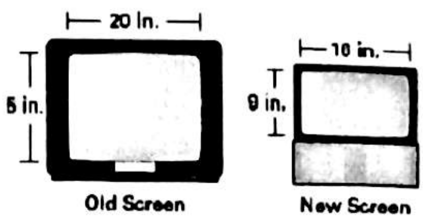
y = 24m



K=2 X=10 ft

The screen on your old television is 20 inches wide and 15 inches high. The screen on your new widescreen television is 16 inches wide and 9 inches high. Is the screen on your new TV a dilation of the screen on your old TV? Explain.

No the sides are not proportional.



Rules for Translating

Left and Right: add translation # to x-value, y-values stay the same.

ex: (3, 2) $\xrightarrow{3}$ (6, 2)

Up and Down: add translation # to y-value, x-values stay the same.

ex: (3, 2) $\xrightarrow{3}$ (3, 5)

Reflecting over X-axis: x-value stays the same, sign changes on y-value

ex (3, 2) → (3, -2)

Reflecting over Y-axis: y-value stays the same, sign changes on x-value

ex (3, 2) → (-3, 2)

Rotating 90 degrees: x and y values switch, sign changes on new y-value.

ex: (3, 2) → (+2, -3)

Rotating 180 degrees: Sign changes on x and y-values

ex: (3, 2) → (-3, -2)

Rotating 270 degrees: x and y-values switch, sign changes on new - x values

ex: (3, 2) → (-2, +3)

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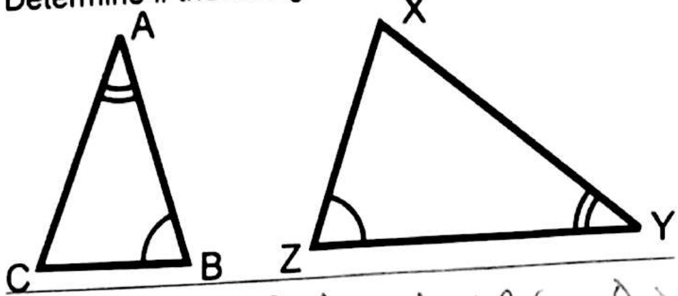
Similarity Theorems

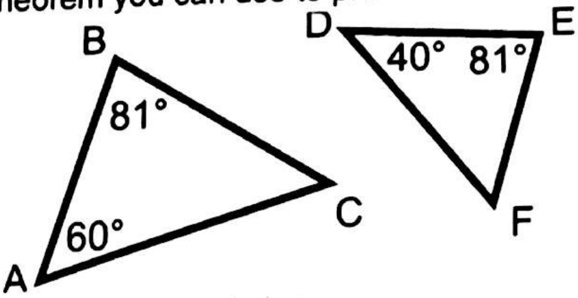
Angle-Angle (AA) Theorem: If two angles of one triangle are congruent to two angles of another triangle than the two triangles are similar.

Side-Side-Side (SSS) Theorem: If the three sides of one triangle are proportional to the three sides of another triangle than the two triangles are similar.

Side-Angle-Side (SAS) Theorem: If two sides of one triangle are proportional to two sides of another triangle and their included angles are congruent than the two triangles are similar.

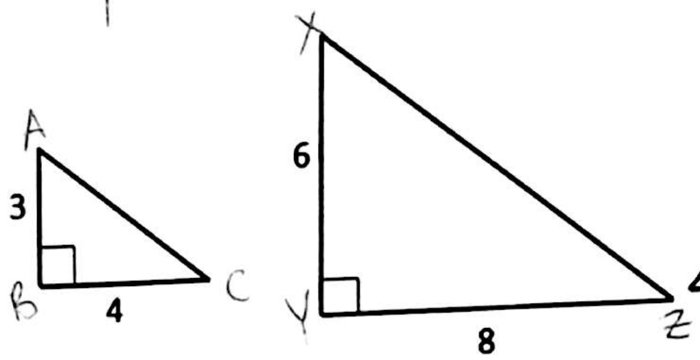
Determine if the triangles are similar, if yes state which theorem you can use to prove it:

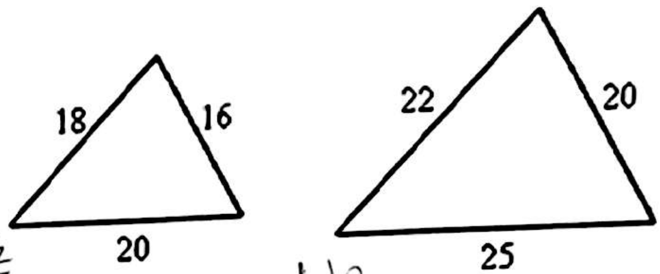




Yes AA $\triangle ABC \sim \triangle YZX$

No





No

yes SAS. $\triangle ABC \sim \triangle XYZ$

Decide if the following triangles similar, not similar, or there is not enough information. Explain why.

1. The three angles of triangle ABC are equal to the three angles of triangle DEF.

   Yes. AA.

2. 2 of the sides of triangle ABC are proportional to two of the sides of triangle DEF

   No Not enough information

3. 2 of the angles of triangle ABC are equal to two of the angles of triangle DEF

   Yes. AA.

If two triangles are similar, how do their angles relate? How do their sides relate?

angles are the same. Sides are proportional

What information could you have to know two triangles are similar? Give at least three possibilities.

AA, SSS, SAS