UNIT 1-8 INVESTIGATING PROPERTIES OF DILATIONS

List the rigid motions:

Translations

Reflections

Rotations

List the non-rigid motions:

Dilations

Stretch

Compression

How do you know if it is a rigid motion or non-rigid motion? It is rigid motion if the figure has not changed its shape or size.

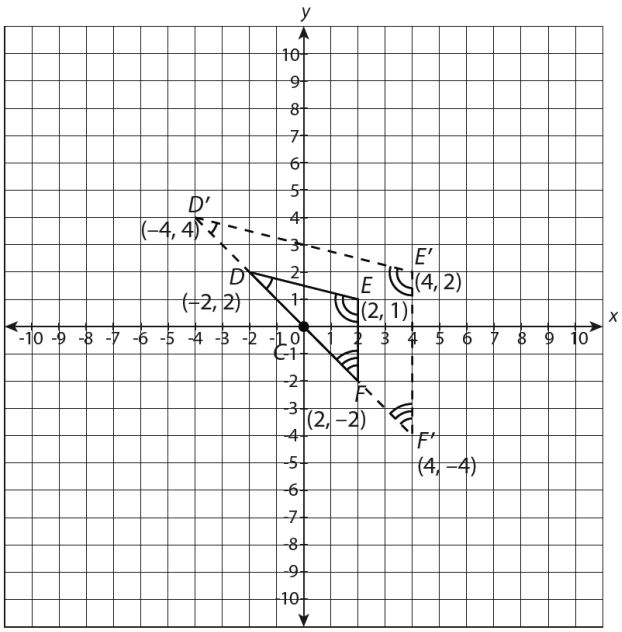
Dilation are transformations in which a figure is either enlarged or reduced by a scale factor in relation to a center point.

Scale factor of a figure is a multiple of the lengths of the sides from one figure to the transformed figure. Scale factor notation: k

Use a ratio of corresponding sides to find the scale factor: $\frac{length\ of\ image\ side}{length\ of\ preimage\ side}$ = scale factor

Notation of a dilation $D_k(x, y) = (kx, ky)$

Ex 1) Is the following transformation a dilation? Justify your answer using the properties of dilations.



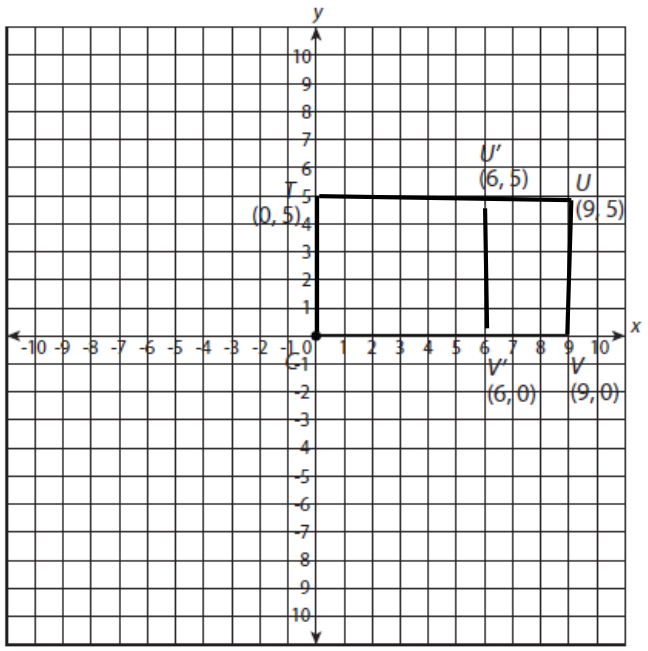
Prove scale factor is constant:

$\frac{Dx'}{Dx} = \frac{-4}{-2} = 2$ $\frac{Ex'}{Ex} = \frac{4}{2} = 2$ $\frac{Fx'}{Fx} = \frac{4}{2} = 2$

$\frac{Dy'}{Dy} = \frac{4}{2} = 2$ $\frac{Ey'}{Ey} = \frac{2}{1} = 2$ $\frac{Fy'}{Fy} = \frac{-4}{-2} = 2$

Since scale factor is constant (all vertices have scale factor = 2, the following transformation is a dilation.

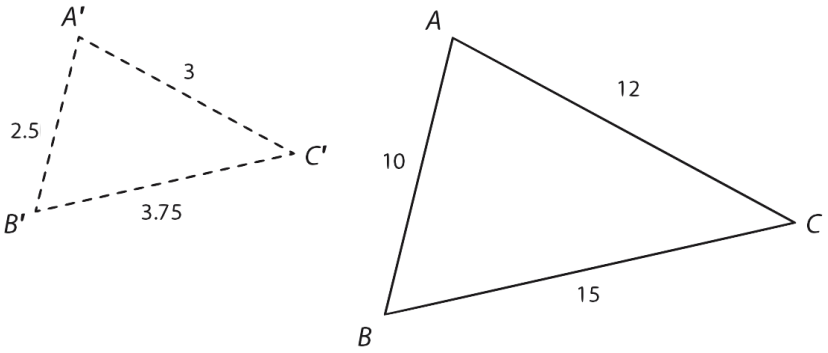
Ex 2) Is the following transformation a dilation? Justify your answer using the properties of dilations.



TU = CV = 9	T'U' = C'V' = 6
TC = UV = 5	T'C' = U'V' = 5
$\frac{T'U'}{TU} = \frac{6}{9} = \frac{1}{3}$	$\frac{T'C'}{TC} = \frac{5}{5} = 1$

Since scale factor is NOT constant (all vertices have different scale factors ($\frac{1}{3}$ and 1) the following transformation is NOT a dilation.

Ex 3) The following transformation represents a dilation. What is the scale factor? Does this indicate enlargement, reduction, or congruence?



Prove scale factor is constant:

$\frac{A'B'}{AB} = \frac{2.5}{10} = \frac{1}{4}$ $\frac{A'C'}{AC} = \frac{3}{12} = \frac{1}{4}$ $\frac{B'C'}{BC} = \frac{3.75}{15} = \frac{1}{4}$

Since scale factor is constant (all vertices have the same scale factor = $\frac{1}{4}$ the following transformation is a dilation. Since the scale factor is between 0 and 1, it is a reduction.