

Core Concept Dilations

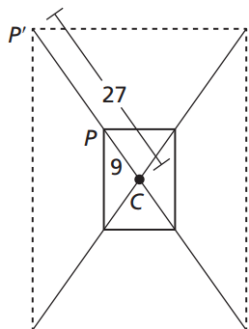
_____ are a type of transformations in which a figure is _____
or _____ with respect to a fixed point called the _____.

In dilations _____ stay the same but _____ are changed by a
variable (k) called the _____.

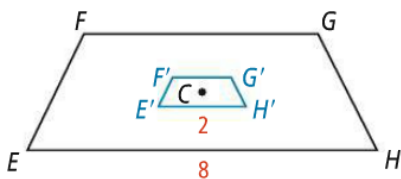
If $k < 1$ the image will be _____.

If $k > 1$ the image will be _____.

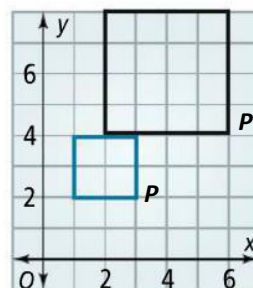
Ex 1: Find the scale factor.



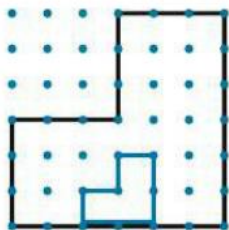
Ex 2: Find the scale factor.



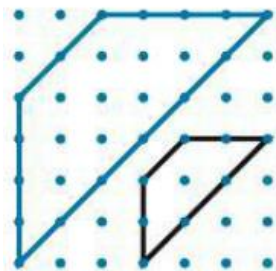
Ex 3: Find the scale factor.



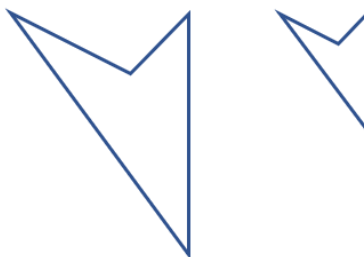
Ex 4: Find the center.



Ex 5: Find the center.



Ex 6: Find the center.



Ex 7: Dilation:

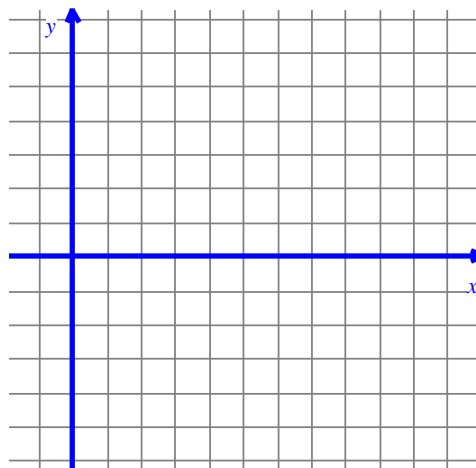
$\triangle UVW$ such that $U(2, -1)$ $V(4, -3)$ $W(5, 1)$

Center: $(0, 0)$ **Scale factor:** $k = 2$

Coordinate Rule: $(x, y) \rightarrow (\quad)$

Use tables to organize your work:

preimage			Image		
	x	y			
U			U'		
V			V'		
W			W'		



Ch. 4&6: HW #4 (**skip the assignment on the assignment sheet and do this one instead**)

1. Copy the table and complete a new table for the given transformation. Show the coordinate rule in your image table. Graph the preimage and image on the same axes. Label points with the “prime” notation.

<p>a) Dilation Center: $(0,0)$ $k = \frac{1}{3}$</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>D</td><td>-3</td><td>6</td></tr> <tr><td>U</td><td>0</td><td>6</td></tr> <tr><td>C</td><td>3</td><td>3</td></tr> <tr><td>K</td><td>-3</td><td>-3</td></tr> </tbody> </table>	preimage				x	y	D	-3	6	U	0	6	C	3	3	K	-3	-3	<p>b) Dilation Center: $(0,0)$ $k = 3$</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>G</td><td>1</td><td>1</td></tr> <tr><td>O</td><td>1</td><td>2</td></tr> <tr><td>A</td><td>3</td><td>2</td></tr> <tr><td>T</td><td>3</td><td>1</td></tr> </tbody> </table>	preimage				x	y	G	1	1	O	1	2	A	3	2	T	3	1	<p>c) Dilation Center: $(0,0)$ $k = \frac{5}{2}$</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>C</td><td>0</td><td>4</td></tr> <tr><td>A</td><td>2</td><td>-1</td></tr> <tr><td>T</td><td>-4</td><td>-2</td></tr> </tbody> </table>	preimage				x	y	C	0	4	A	2	-1	T	-4	-2			
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<p>d) Reflection Line of Reflection: y-axis</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>F</td><td>-3</td><td>6</td></tr> <tr><td>R</td><td>0</td><td>6</td></tr> <tr><td>O</td><td>3</td><td>3</td></tr> <tr><td>G</td><td>-3</td><td>-3</td></tr> </tbody> </table>	preimage				x	y	F	-3	6	R	0	6	O	3	3	G	-3	-3	<p>e) Translation Vector: $\langle -3, 2 \rangle$</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>F</td><td>1</td><td>1</td></tr> <tr><td>I</td><td>1</td><td>2</td></tr> <tr><td>S</td><td>3</td><td>2</td></tr> <tr><td>H</td><td>3</td><td>1</td></tr> </tbody> </table>	preimage				x	y	F	1	1	I	1	2	S	3	2	H	3	1	<p>f) Rotation Center: $(0,0)$ angle: 180°</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr><th colspan="3">preimage</th></tr> <tr><th></th><th>x</th><th>y</th></tr> </thead> <tbody> <tr><td>B</td><td>4</td><td>0</td></tr> <tr><td>I</td><td>1</td><td>3</td></tr> <tr><td>R</td><td>3</td><td>2</td></tr> <tr><td>D</td><td>4</td><td>5</td></tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-left: 20px; width: fit-content;"> Connect the points in order B-I-R-D </div>	preimage				x	y	B	4	0	I	1	3	R	3	2	D	4	5
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2. Dilations without a coordinate rule:

<p>a) Copy the diagram at right onto graph paper. Complete a dilation with center C and scale factor $k = \frac{1}{2}$</p> <p>b) Copy the diagram at right onto graph paper (again). Complete a dilation with center D and scale factor $k = \frac{1}{2}$</p>	
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3. Coordinate Rules and Transformations: Ex: Translation right 1 and down 2. $(x, y) \rightarrow (x + 1, y - 2)$

Write a coordinate rule for each:	Write a description of the transformation.
a) Translation left 3 and up 7.	e) $(x, y) \rightarrow (2x, 2y)$
b) Rotation 180° about $(0,0)$.	f) $(x, y) \rightarrow (-x, y)$
c) Reflection across the x -axis.	g) $(x, y) \rightarrow (y, x)$
d) Dilation with center $(0,0)$ and scale factor 5.	

4. Solve the following quadratic equations using two methods. (i) Factoring (ii) Quadratic Formula. **Do each problem twice** and show that the answers are the same.

a) $x^2 + 8x + 7 = 0$	b) $2x^2 - 3x - 9 = 0$	c) $5x^2 - 12x + 4 = 0$
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