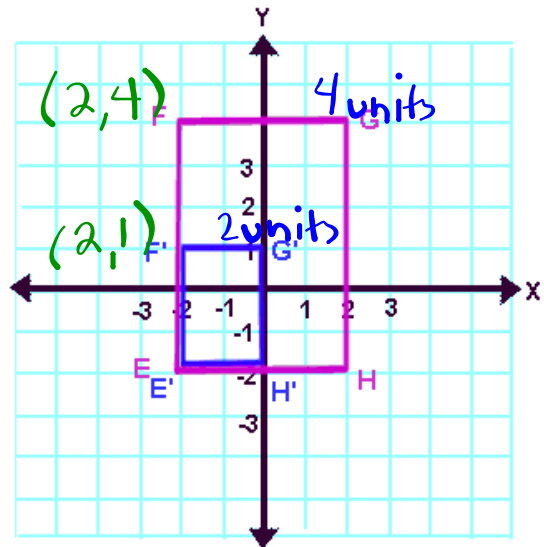
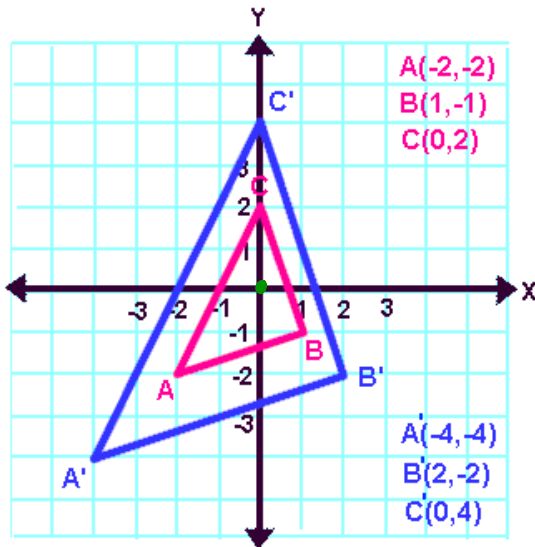


Warm Up

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Are these enlarged or reduced?

What is the scale factor?



compare $(0,2)$ to $(0,4)$

$$(x,y) \rightarrow (fx, fy)$$

Scale factor = 2

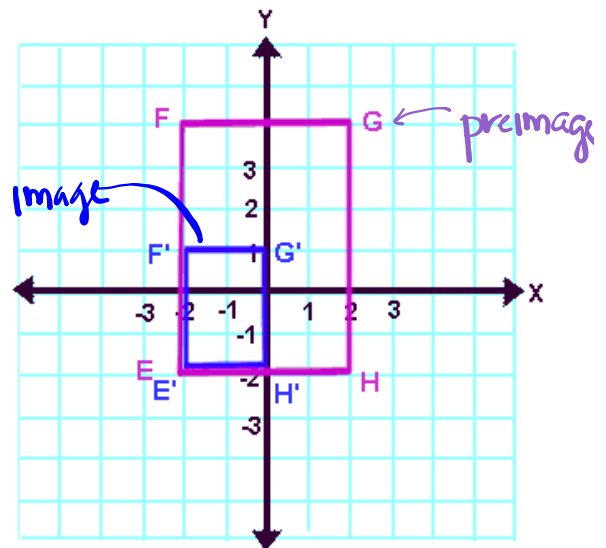
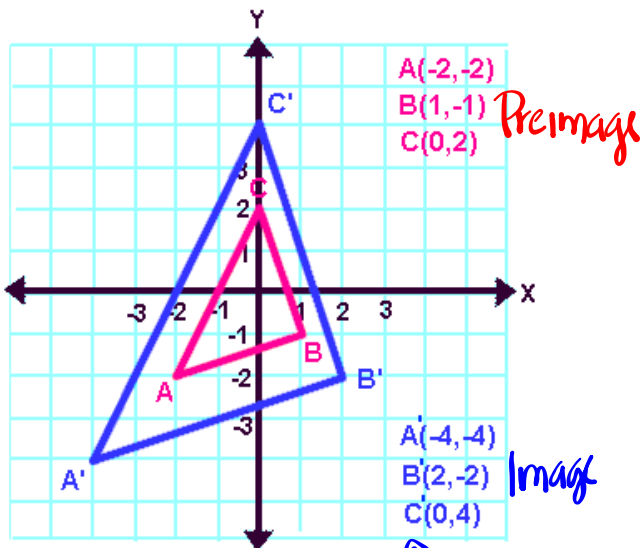
Enlarged

$$\frac{\text{Image length}}{\text{preimage length}} = \frac{2}{4} = \frac{1}{2}$$

Scale factor = 0.5

Reduced

Practice finding the scale factor: $\frac{\text{Image}}{\text{Preimage}}$



Let's compare how far C and C' are from the origin

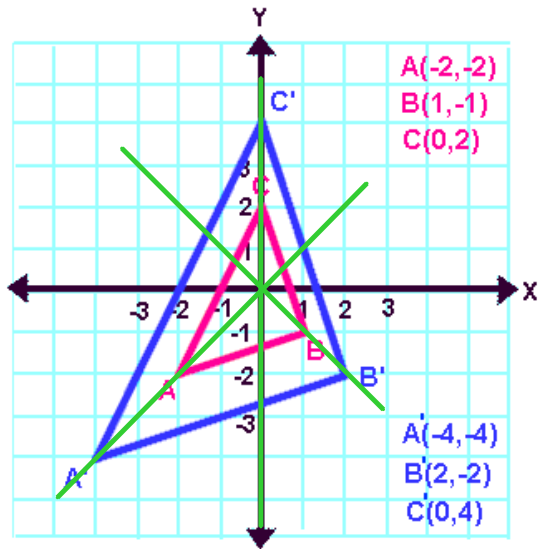
Has the prime marks

$$\text{factor} = \frac{2}{4} = \frac{1}{2}$$

$$\text{Factor} = \frac{4}{2} = 2$$

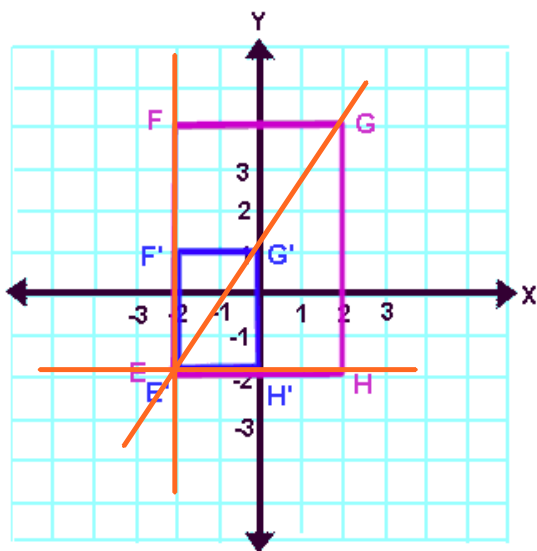
How to find the point of dilation?

We know that corresponding points of the preimage and image are in a line coming from the point of dilation



By drawing lines that connect each pair of points we can see where they intersect.

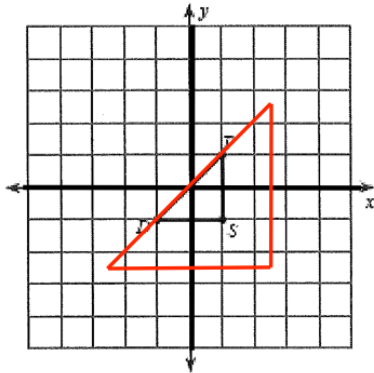
Point of dilation is the origin, $(0, 0)$.



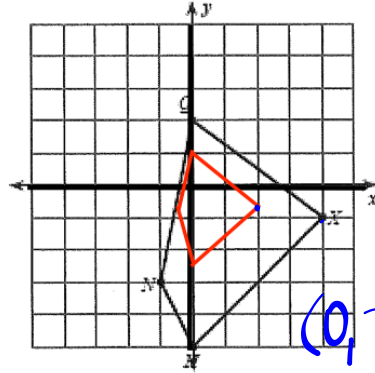
Point of dilation here is $(-2, -2)$.

are from the origin unless otherwise noted.

1. Dilation of 2.5



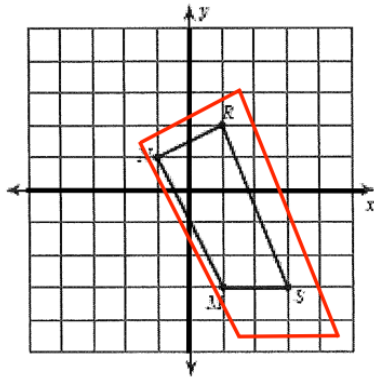
2. Dilation of 0.5



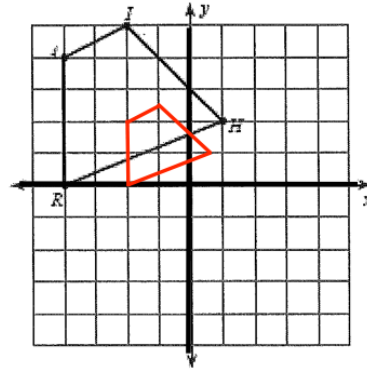
$$\frac{1}{2}$$

$$(0, 2) \rightarrow (0, 1)$$

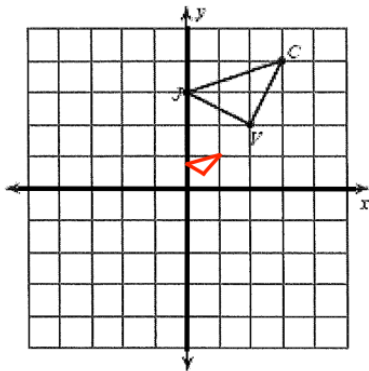
3. Dilation of 1.5



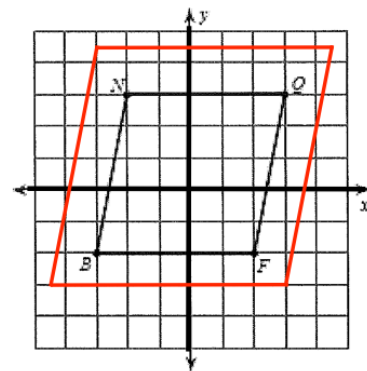
4. Dilation of 0.5



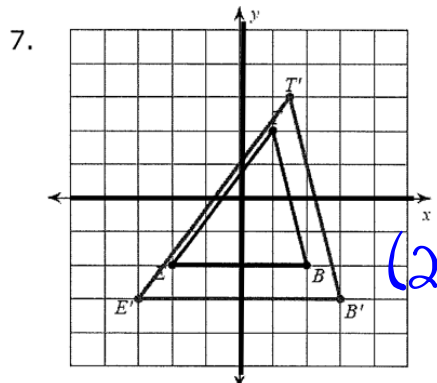
5. Dilation of $\frac{1}{4}$



6. Dilation of 1.5

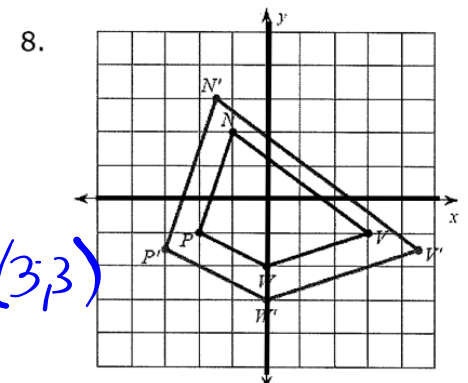


Write a rule to describe each transformation. $(x, y) \rightarrow (fx, fy)$

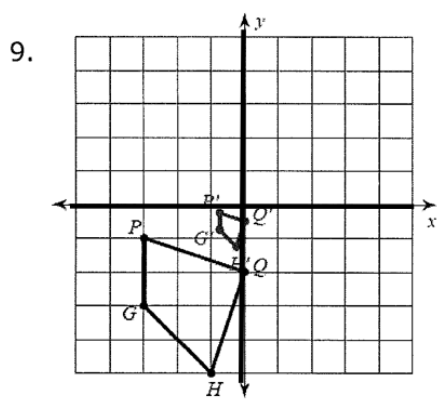


$(2, 2) \rightarrow (3, 3)$

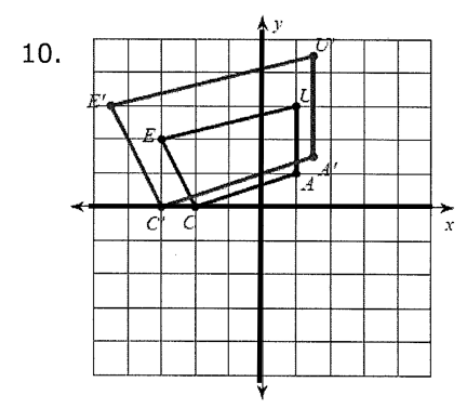
$(x, y) \rightarrow (1.5x, 1.5y)$



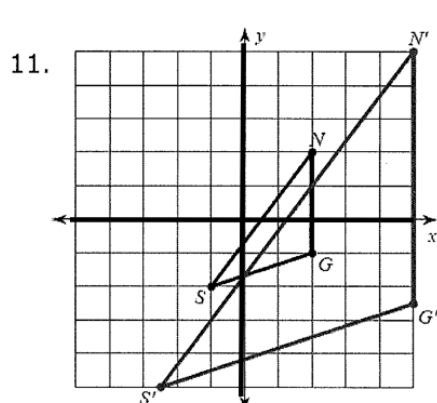
$(x, y) \rightarrow (1.5x, 1.5y)$



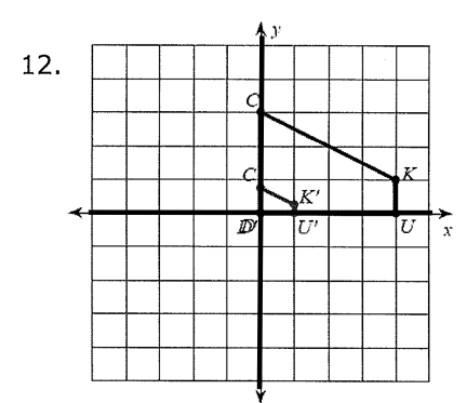
$(x, y) \rightarrow (.25x, .25y)$



$(x, y) \rightarrow (1.5x, 1.5y)$



$(x, y) \rightarrow (2.5x, 2.5y)$



$(x, y) \rightarrow (.25x, .25y)$

Write a rule to describe each transformation.

13. $U(-2, -1)$, $K(0, 2)$, $F(2, -2)$ to $U'(-3, -1.5)$, $K'(0, 3)$, $F'(3, -3)$
 $(x, y) \rightarrow (1.5x, 1.5y)$

14. $V(-1, -2)$, $K(-1, 3)$, $Y(1, 0)$ to $V'(-1.5, -3)$, $K'(-1.5, 4.5)$, $Y'(1.5, 0)$
 $(x, y) \rightarrow (1.5x, 1.5y)$

15. $K(-1, -2)$, $U(-2, 2)$, $V(2, 2)$, $Q(2, -1)$ to $K'(-2, -4)$, $U'(-4, 4)$, $V'(4, 4)$, $Q'(4, -2)$
 $(x, y) \rightarrow (2x, 2y)$

16. $N(-4, 1)$, $T(-5, 3)$, $J(-4, 3)$, $C(-1, 0)$ to $N'(-1, 0.25)$, $T'(-1.25, 0.75)$, $J'(-1, 0.75)$,
 $C'(-0.25, 0)$
 $(x, y) \rightarrow (.25x, .25y)$

17. $K(-1, 0)$, $N(-2, 2)$, $H(3, 3)$, $T(3, -2)$ to $K'(-1.5, 0)$, $N'(-3, 3)$, $H'(4.5, 4.5)$,
 $T'(4.5, -3)$
 $(x, y) \rightarrow (1.5x, 1.5y)$

Write the coordinates of the vertices after the given transformation.

18. Dilation of 4
 $N(0, 1)$, $O(1, 1)$, $P(0, 8)$
 $N'(0, 4)$, $O'(4, 4)$, $P'(0, 32)$

19. Dilation of 1.5
 $V(-2, -2)$, $I(1, 2)$, $F(2, 0)$
 $V'(-3, -3)$, $I'(1.5, 3)$, $F'(3, 0)$

20. Dilation of $\frac{1}{2}$
 $U(3, 2)$, $C(4, 4)$, $E(5, 2)$
 $U'(1.5, 1)$, $C'(2, 2)$, $E'(2.5, 1)$

21. Dilation of 2
 $H(-1, -2)$, $A(-2, 2)$, $W(2, 2)$
 $H'(-2, -4)$, $A'(-4, 4)$, $W'(4, 4)$

22. Dilation of $\frac{1}{4}$
 $W(-4, -5)$, $X(-5, -1)$, $T(-3, 0)$
 $W'(-1, -1.25)$, $X'(-1.25, -.25)$, $T'(-.75, 0)$

23. Dilation of 5
 $Q(-3, -3)$, $M(0, -1)$, $H(1, -3)$
 $Q'(-15, -15)$, $M'(0, -5)$, $H'(5, -15)$

24. Dilation of 3
 $Q(-3, -3)$, $M(0, -1)$, $H(1, -3)$
 $Q'(-9, -9)$, $M'(0, -3)$, $H'(3, -9)$

25. Dilation of $\frac{5}{2}$
 $C(-1, -2)$, $V(-2, 2)$, $N(2, 0)$
 $C'(-2.5, -5)$, $V'(-5, 5)$, $N'(5, 0)$

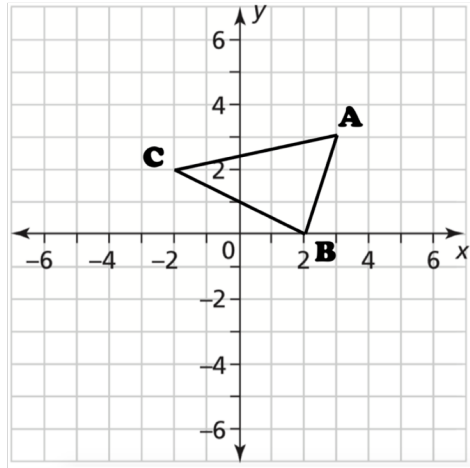
Name _____ Block _____ Date _____

Transformations and Congruence

We will be using $\triangle ABC$ as our Preimage for all of the following problems.

1. Using the Pythagorean Theorem, calculate the lengths of each side of $\triangle ABC$. Round your answers to the nearest tenth.
Show work below.

AB =



BC =

AC =

AB =

BC =

AC =

2. Calculate the slope for each side of $\triangle ABC$.

Slope AB =

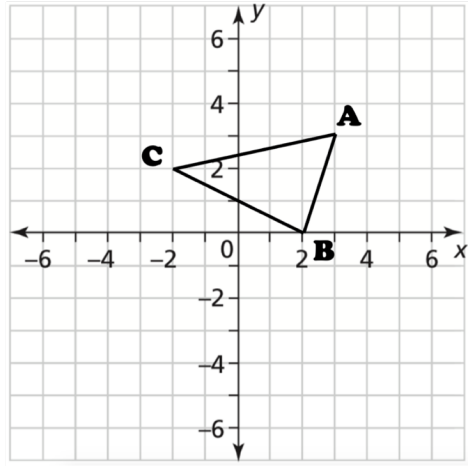
Slope BC =

Slope AC =

For each of the following questions, graph the transformation and then answer the questions.

3. **Translate** $\triangle ABC$ following the rule $(x, y) \rightarrow (x - 2, y - 3)$

Using the Pythagorean Theorem, calculate the length of side $A'B'$. Round your answer to the nearest tenth.



Calculate the slope for each side of $\triangle A'B'C'$.

Slope $A'B' =$

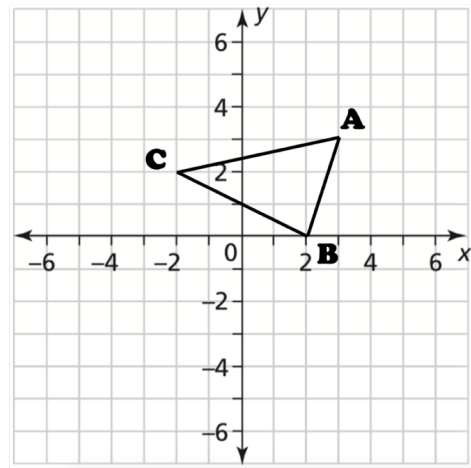
Slope $B'C' =$

Slope $A'C' =$

How do the length of $A'B'$ and the slopes of the sides compare to those of $\triangle ABC$?

4. **Reflect** $\triangle ABC$ across the line $y = -1$.

Using the Pythagorean Theorem, calculate the length of side $A'B'$. Round your answer to the nearest tenth.



Calculate the slope for each side of $\triangle A'B'C'$.

Slope $A'B' =$

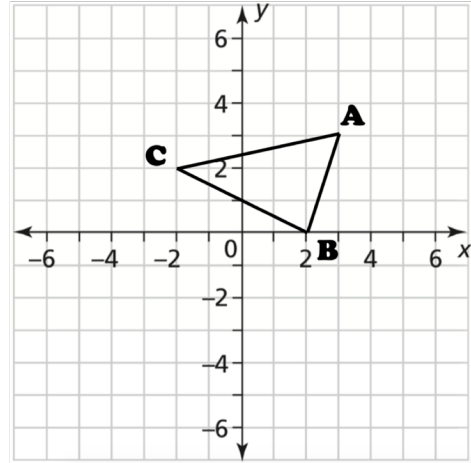
Slope $B'C' =$

Slope $A'C' =$

How do the length of $A'B'$ and the slopes of the sides compare to those of $\triangle ABC$?

5. **Rotate** $\triangle ABC$ 90° clockwise around the point $(0, 0)$.

Using the Pythagorean Theorem, calculate the length of side $A'B'$. Round your answer to the nearest tenth.



Calculate the slope for each side of $\triangle A'B'C'$.

Slope $A'B'$ =

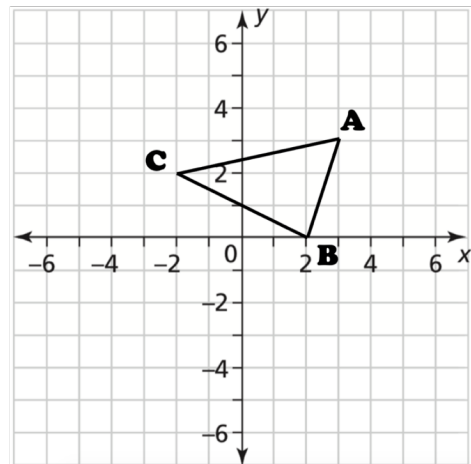
Slope $B'C'$ =

Slope $A'C'$ =

How do the length of $A'B'$ and the slopes of the sides compare to those of $\triangle ABC$?

6. **Dilate** $\triangle ABC$ by a factor of two from the origin $(0, 0)$.

Using the Pythagorean Theorem, calculate the length of side $A'B'$. Round your answer to the nearest tenth.



Calculate the slope for each side of $\triangle A'B'C'$.

Slope $A'B'$ =

Slope $B'C'$ =

Slope $A'C'$ =

How do the length of $A'B'$ and the slopes of the sides compare to those of $\triangle ABC$?

7. For which transformations are the following statements true? Check the appropriate boxes.

	Translation	Reflection	Rotation	Dilation
Corresponding sides of the Preimage and Image are parallel .				
Corresponding sides of the Preimage and Image are the same size .				
Corresponding angle measures of the Preimage and Image are the same size .				
The image and preimage are congruent .				