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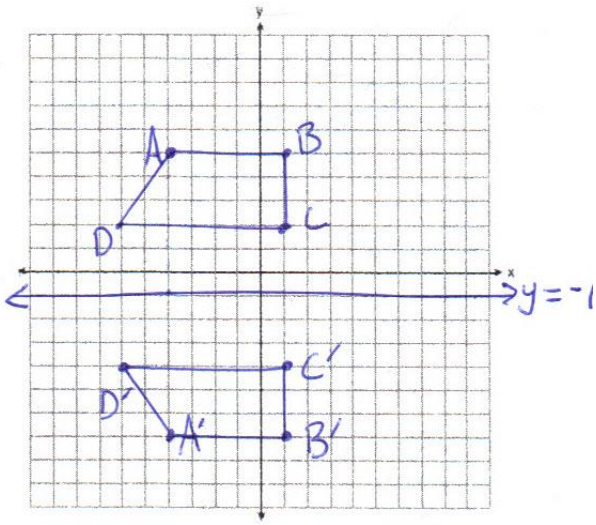
Date _____
Geometry

Transformations Regents Review

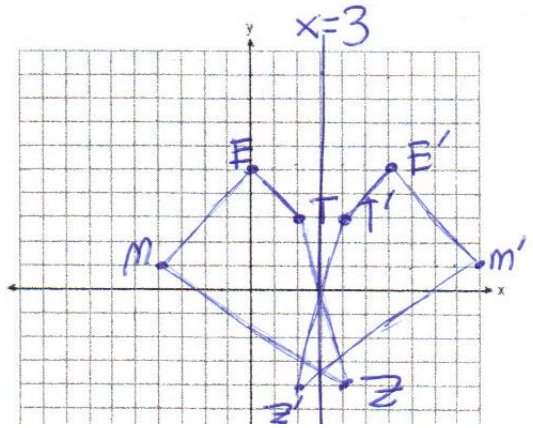
1. The coordinates of trapezoid $ABCD$ are $A(-4,5)$, $B(1,5)$, $C(1,2)$, and $D(-6,2)$. Trapezoid $A'B'C'D'$ is the image after a reflection over the line $y=-1$. State the coordinates of trapezoid $A'B'C'D'$.

$A(-4,5) \xrightarrow{y=-1} (-4,-7)\ A'$
$B(1,5) \rightarrow (1,-7)\ B'$
$C(1,2) \rightarrow (1,-4)\ C'$
$D(-6,2) \rightarrow (-6,-4)\ D'$



2. The coordinates of the vertices of quadrilateral METZ are M(-4,1), E(0,5), T(2,3), and Z(4,-4). Graph and state the coordinates of quadrilateral M'E'T'Z', the image of quadrilateral METZ after a reflection in the line $x=3$.

$M(-4,1) \xrightarrow{x=3} (10,1)$
$E(0,5) \rightarrow (6,5)$
$T(2,3) \rightarrow (4,3)$
$Z(4,-4) \rightarrow (2,-4)$



3. The coordinates of trapezoid $ABCD$ are $A(-4, 5)$, $B(1, 5)$, $C(1, 2)$, and $D(-6, 2)$. Trapezoid $A''B''C''D''$ is the image after a reflection in the line $y = x$ followed by a reflection in the x axis. State the coordinates of trapezoid $A''B''C''D''$.

$A(-4,5) \xrightarrow{y=x} (5,-4) \xrightarrow{x\text{-axis}} (5,4)$

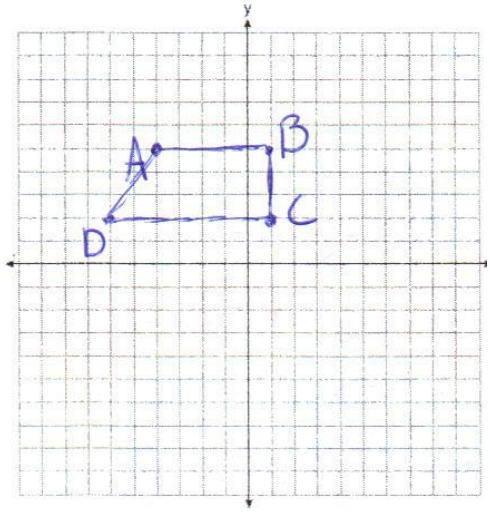
$B(1,5) \rightarrow (5,1) \rightarrow (5,-1)$

$C(1,2) \rightarrow (2,1) \rightarrow (2,-1)$

$D(-6,2) \rightarrow (2,-6) \rightarrow (2,6)$

Switch the Points

Keep the axis you're reflecting over



4. Triangle MKY has vertices M(6,-4), K(-4,-2), and Y(-2,6)

Graph the image of triangle MKY after a dilation of $\frac{1}{2}$ followed by a rotation of 90 and label it $\Delta M'K'Y'$.

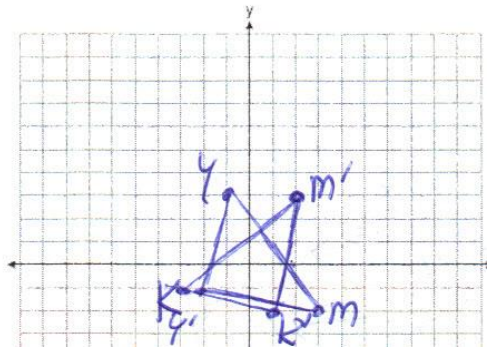
$M(6,-4) \xrightarrow{D\frac{1}{2}} (3,-2) \xrightarrow{R_{90}} (2,3)$

$K(-4,-2) \rightarrow (-2,-1) \rightarrow (1,-2)$

$Y(-2,6) \rightarrow (-1,3) \rightarrow (-3,-1)$

multiply

turn the paper



5. The vertices of ΔJKL have coordinates $J(5,1)$, $K(-2,-3)$, and $L(-4,1)$. Under which transformation is the image $\Delta J'K'L'$ *not* congruent to ΔJKL? dilation

1) a translation of two units to the right and two units down
2) a counterclockwise rotation of 180 degrees around the origin
3) a reflection over the x-axis
4) a dilation with a scale factor of 2 and centered at the origin

6. If $\triangle A'B'C'$ is the image of $\triangle ABC$, under which transformation will the triangles *not* be congruent? dilation

1) reflection over the x-axis
2) translation to the left 5 and down 4
3) dilation centered at the origin with scale factor 2
4) rotation of 270° counterclockwise about the origin

7. A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?

1) The area of the image is nine times the area of the original triangle.
2) The perimeter of the image is nine times the perimeter of the original triangle.
3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

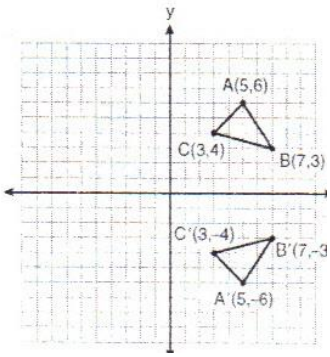
8. Which transformation would result in the perimeter of a triangle being different from the perimeter of its image?

1) $(x,y) \rightarrow (y,x)$
2) $(x,y) \rightarrow (x,-y)$
3) $(x,y) \rightarrow (4x,4y)$ dilation
4) $(x,y) \rightarrow (x+2,y-5)$

9. The image of rhombus $VWXY$ preserves which properties under the transformation $T_{2,-3}$?

1) parallelism, only
2) orientation, only
3) both parallelism and orientation
4) neither parallelism nor orientation

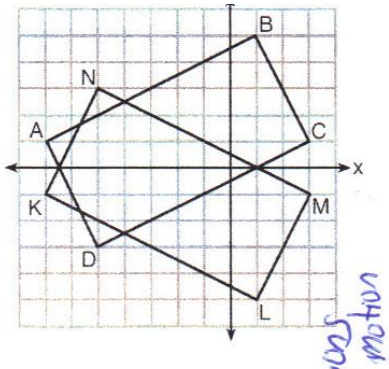
10. The rectangle $ABCD$ shown in the diagram below



12. Which expression best describes the transformation shown in the diagram below?

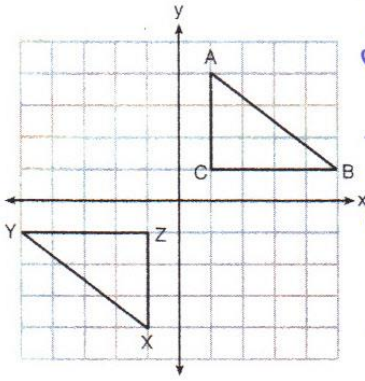
1) same orientation; reflection
2) opposite orientation; reflection
3) same orientation; translation
4) opposite orientation; translation

11. On the set of axes below, rectangle *ABCD* and rectangle *KLMN* are graphed. Use the properties of rigid motions to prove that the rectangles are congruent.



ABCD is reflected over the x axis to map onto KLMN. A reflection is a rigid motion. A rigid motion preserves size and angle measure

12. In the diagram below, $\triangle ABC$ and $\triangle XYZ$ are graphed.

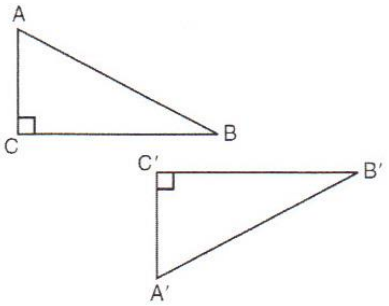


Use the properties of rigid motions to explain why $\triangle ABC \cong \triangle XYZ$.

ΔABC is rotated 180 about the origin to map onto ΔXYZ. A rotation is a rigid motion. A rigid motion preserves size and angle measure producing a congruent figure.

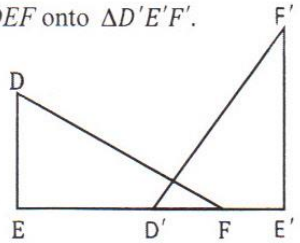
1) Identify the transformations
2) State that it's a rigid motion
3) Tell me what that means

13. The diagram below shows ΔABC and $\Delta A'B'C'$. Describe a sequence of rigid motions that maps ΔABC onto $\Delta A'B'C'$.



1) Translate $\overline{BC}$ to $\overline{B'C'}$ and then reflect ΔABC over $\overline{B'C'}$ to map ΔABC onto ΔA'B'C'.
2) A translation and reflection are rigid motions.
3) A rigid motion preserves size and angle measure producing a congruent figure.

14. Describe a sequence of rigid motions that maps ΔDEF onto $\Delta D'E'F'$.



1) Translate E to E' and then rotate ΔDEF about E until ΔDEF maps onto ΔDÉF'.
2) A translation and rotation are rigid motions.

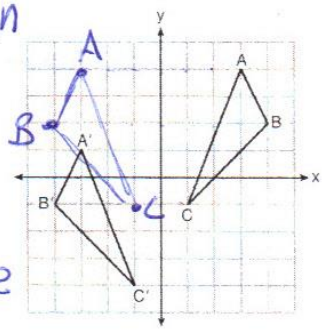
Justify that $\Delta DEF \cong \Delta D'E'F'$.

3) A rigid motion preserves size and angle measure producing a congruent figure.

15. As graphed on the set of axes below, $\triangle A'B'C'$ is the image of $\triangle ABC$ after a sequence of transformations.

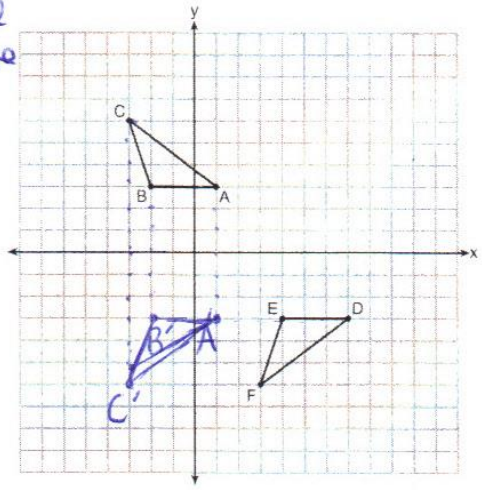
Is $\triangle A'B'C'$ congruent to $\triangle ABC$? Use the properties of rigid motion to explain your answer

1) reflect $\triangle ABC$ over the y axis and then translate 3 units down.
2) A reflection and translation are rigid motions.
3) A rigid motion preserves size and angle measure producing a congruent figure

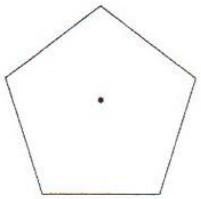


16. Describe a sequence of transformations that will map $\triangle ABC$ onto $\triangle DEF$ as shown below

1) reflect $\triangle ABC$ over the x axis and then translate 6 units to the right
2) A reflection and translation are rigid motions
3) A rigid motion preserves size and angle measure producing a congruent figure.



17. A regular pentagon is shown in the diagram below.



If the pentagon is rotated clockwise around its center, the minimum number of degrees it must be rotated to carry the pentagon onto itself is

1) 54°
2) ~~72°~~
3) 108°
4) 360°

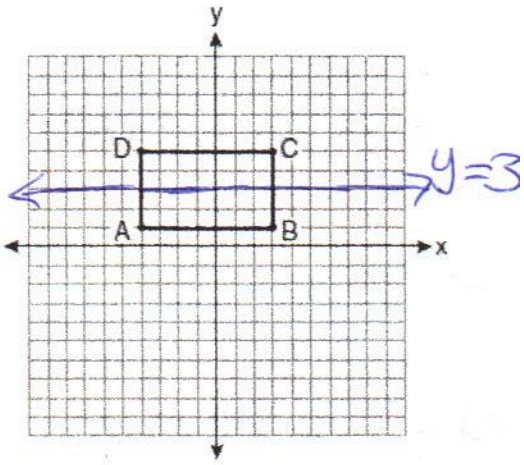
$\frac{360}{n}$ $\frac{360}{5}=72$

18. Which of the following rotations would not map an equilateral triangle onto itself?

(1) 120°
(2) 240°
(3) ~~180°~~
(4) 480°

$\frac{360}{3}=120$ 120, 240, 360, 480, ...

19. On the set of axes below, Geoff drew rectangle *ABCD*.



What of the following transformations would map the rectangle onto itself?

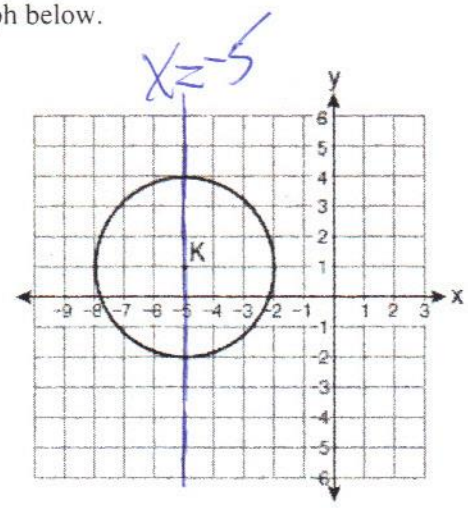
1) r_{y-axis}

2) $r_{y=3}$

3) R_{90}

4) $T_{1,0}$

20. Circle *K* is shown in the graph below.



Which of the following transformations map circle K onto itself?

1) $r_{y=x}$

2) $r_{x=-5}$

3) r_{x-axis}

4) $r_{y=2}$