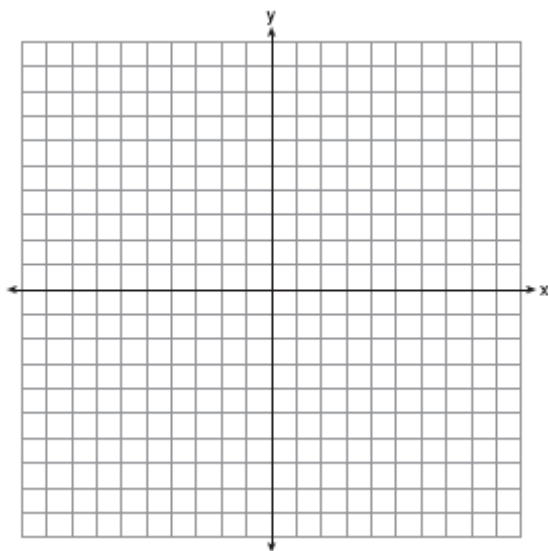


NAME: _____

G.G.58: Define, investigate, justify, and apply similarities (dilations and the composition of dilations and isometries)

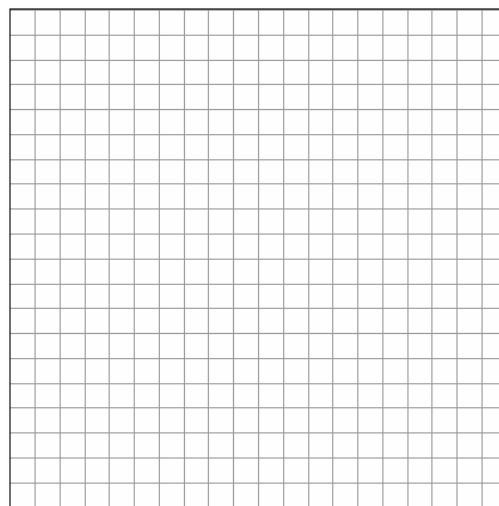
1. 060937ge, P.I. G.G.58

The coordinates of the vertices of parallelogram $ABCD$ are $A(-2,2)$, $B(3,5)$, $C(4,2)$, and $D(-1,-1)$. State the coordinates of the vertices of parallelogram $A''B''C''D''$ that result from the transformation $r_{y\text{-axis}} \circ T_{2,-3}$. [The use of the set of axes below is optional.]



2. 060928b, P.I. G.G.58

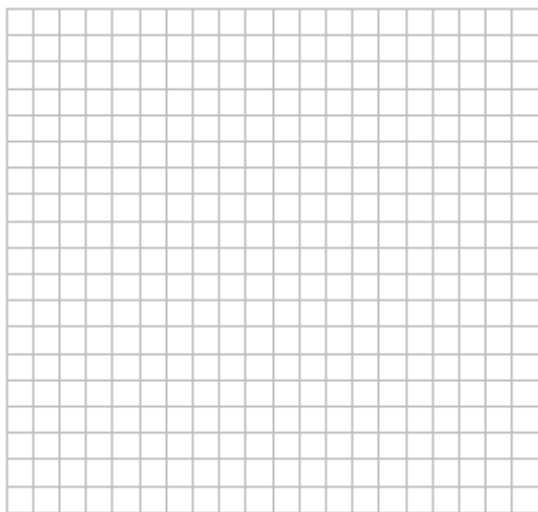
On the accompanying grid, graph and label $\triangle ABC$ with vertices $A(3,1)$, $B(0,4)$, and $C(-5,3)$. On the same grid, graph and label $\triangle A''B''C''$, the image of $\triangle ABC$ after the transformation $r_{x\text{-axis}} \circ r_{y=x}$.



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3. 010930b, P.I. G.G.58

Farmington, New York, has plans for a new triangular park. If plotted on a coordinate grid, the vertices would be $A(3,3)$, $B(5,-2)$, and $C(-3,-1)$. However, a tract of land has become available that would enable the planners to increase the size of the park, which is based on the following transformation of the original triangular park, $R_{270} \circ D_2$. On the grid below, graph and label both the original park $\triangle ABC$ and its image, the new park $\triangle A''B''C''$, following the transformation.



4. fall0823ge, P.I. G.G.58

The endpoints of \overline{AB} are $A(3,2)$ and $B(7,1)$. If $\overline{A''B''}$ is the result of the transformation of \overline{AB} under $D_2 \circ T_{-4,3}$ what are the coordinates of A'' and B'' ?

- [A] $A''(-1,5)$ and $B''(3,4)$
[B] $A''(-2,10)$ and $B''(6,8)$
[C] $A''(2,7)$ and $B''(10,5)$
[D] $A''(14,-2)$ and $B''(22,-4)$

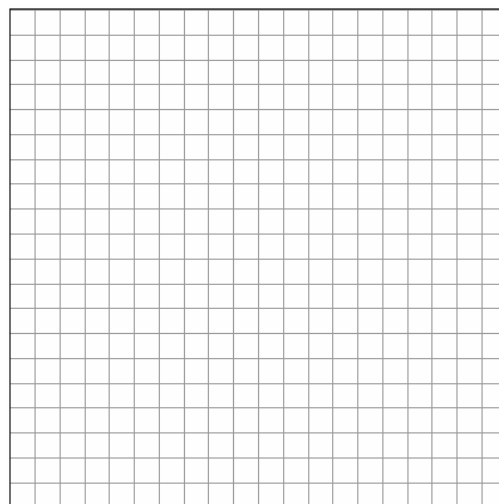
5. 080715b, P.I. G.G.58

The coordinates of $\triangle JRB$ are $J(1,-2)$, $R(-3,6)$, and $B(4,5)$. What are the coordinates of the vertices of its image after the transformation $T_{2,-1} \circ r_{y\text{-axis}}$?

- [A] $(3,1)$, $(-1,-7)$, $(6,-6)$
[B] $(-1,-2)$, $(3,6)$, $(-4,5)$
[C] $(1,-3)$, $(5,5)$, $(-2,4)$
[D] $(3,-3)$, $(-1,5)$, $(6,4)$

6. 080626b, P.I. G.G.58

Given point $A(-2,3)$. State the coordinates of the image of A under the composition $T_{-3,-4} \circ r_{x\text{-axis}}$. [The use of the grid is optional.]



7. 010618b, P.I. G.G.58

What are the coordinates of point A' , the image of point $A(-4,1)$ after the composite transformation $R_{90^\circ} \circ r_{y=x}$ where the origin is the center of rotation?

- [A] $(-1,-4)$ [B] $(-4,-1)$
[C] $(4,1)$ [D] $(1,4)$

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8. 010520b, P.I. G.G.58

If the coordinates of point A are $(-2,3)$, what is the image of A under $r_{y\text{-axis}} \circ D_3$?

- [A] $(5,6)$ [B] $(9,-6)$
[C] $(6,9)$ [D] $(-6,-9)$

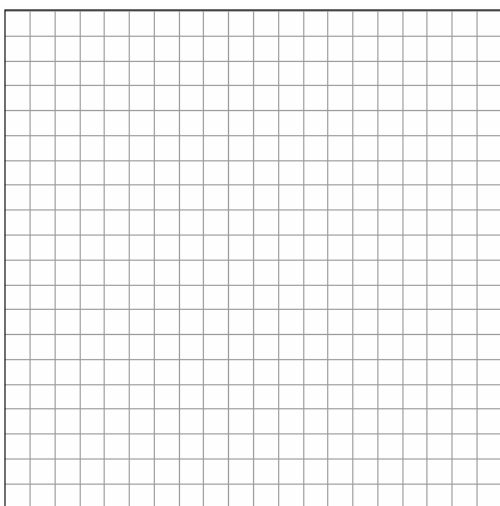
9. 080413b, P.I. G.G.58

What is the image of point $(1,1)$ under $r_{x\text{-axis}} \circ R_{0,90^\circ}$?

- [A] $(1,1)$ [B] $(-1,1)$
[C] $(1,-1)$ [D] $(-1,-1)$

10. 080327b, P.I. G.G.58

On the accompanying grid, graph and label \overline{AB} , where A is $(0,5)$ and B is $(2,0)$. Under the transformation $r_{x\text{-axis}} \circ r_{y\text{-axis}}(\overline{AB})$, A maps to A'' and B maps to B'' . Graph and label $\overline{A''B''}$. What single transformation would map \overline{AB} to $\overline{A''B''}$?



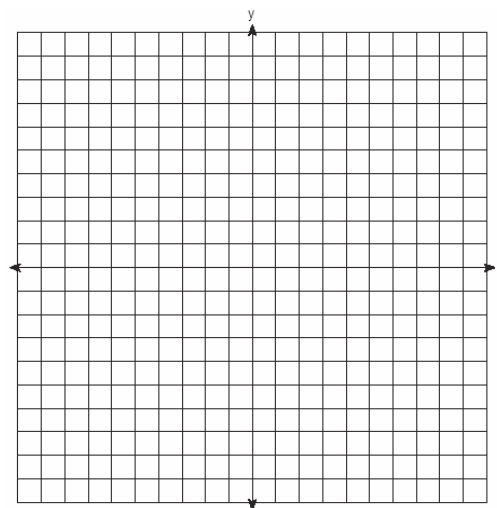
11. 080231b, P.I. G.G.58

Graph and label the following equations, a and b , on the accompanying set of coordinate axes.

$$a: y = x^2$$

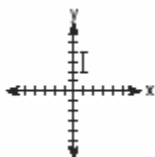
$$b: y = -(x - 4)^2 + 3$$

Describe the composition of transformations performed on a to get b .



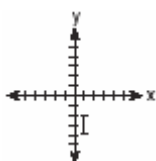
12. 080219b, P.I. G.G.58

The accompanying graph represents the figure Γ .

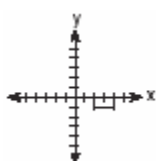


Which graph represents Γ after a transformation defined by $r_{y=x} \circ R_{90^\circ}$?

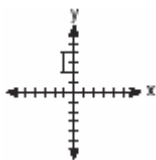
[A]



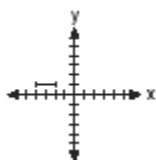
[B]



[C]



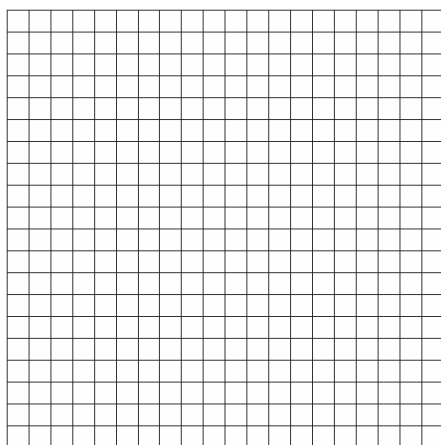
[D]



13. 010232b, P.I. G.G.58

a On the accompanying grid, graph the equation $2y = 2x^2 - 4$ in the interval $-3 \leq x \leq 3$ and label it a .

b On the same grid, sketch the image of a under $T_{5,-2} \circ r_{x\text{-axis}}$ and label it b .

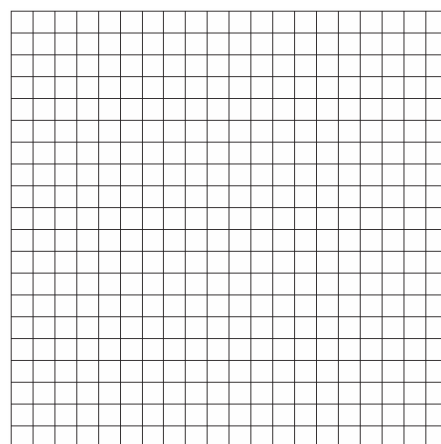


14. 080028a, P.I. G.G.58

The coordinates of the endpoints of \overline{AB} are $A(2,6)$ and $B(4,2)$. Is the image $\overline{A'B'}$ the same if it is reflected in the x -axis, then

dilated by $\frac{1}{2}$ as the image is if it is dilated by

$\frac{1}{2}$, then reflected in the x -axis? Justify your answer.



G.G.58: Define, investigate, justify, and apply similarities (dilations and the composition of dilations and isometries)

- [4] $A''(0,-1)$, $B''(-5,2)$, $C''(-6,-1)$, and $D''(-1,-4)$, and appropriate work is shown.
- [3] The composite transformation is graphed and labeled correctly, but the coordinates are not stated or are stated incorrectly.
or [3] Appropriate work is shown, but one computational or graphing error is made.
- [2] Appropriate work is shown, but two or more computational or graphing errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as performing the reflection before the translation.
- [1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.
or [1] $A''(0,-1)$, $B''(-5,2)$, $C''(-6,-1)$, and $D''(-1,-4)$, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [1]

- [4] Both $\triangle ABC$ and $\triangle A''B''C''$ are graphed and labeled correctly.
- [3] Appropriate work is shown, but one graphing or labeling error is made.
or [3] Appropriate work is shown, but only $\triangle A''B''C''$ is graphed and labeled correctly.
- [2] Appropriate work is shown, but two or more graphing or labeling errors are made.
or [2] Appropriate work is shown, but one conceptual error is made, such as reflecting over the x -axis before reflecting over the line $y = x$.
- [1] Appropriate work is shown, but one conceptual error and one graphing or labeling error are made.
or [1] $A''(1,-3)$, $B''(4,0)$, and $C''(3,5)$ are stated, but no work is shown.
or [1] $\triangle ABC$ is graphed and labeled correctly, but only $r_{y=x}$ or $r_{x\text{-axis}}$ is graphed correctly.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [2]

[4] Triangles ABC and $A''B''C''$ are graphed and labeled correctly. [Students are not required to state the coordinates $A''(6,-6)$, $B''(-4,-10)$, and $C''(-2,6)$.]

[3] Appropriate work is shown, but one computational or graphing error is made.

or [3] Only triangle $A''B''C''$ is graphed and labeled correctly.

[2] Appropriate work is shown, but two or more computational or graphing errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] Triangle ABC is graphed and labeled correctly, and either the rotation or dilation is graphed and labeled correctly.

or [2] The coordinates $A''(6,-6)$, $B''(-4,-10)$, and $C''(-2,6)$ are stated, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.

or [1] Triangle ABC is graphed and labeled correctly, but no further correct work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[3] incorrect procedure.

[4] B _____

[5] C _____

[2] $(-5,-7)$, and appropriate work is shown, such as stating the coordinates of each transformation or graphing each transformation.

[1] Appropriate work is shown, but one computational or graphing error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as performing the translation before the reflection.

or [1] Only one of the transformations is performed correctly.

or [1] $(-5,-7)$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[6] incorrect procedure.

[7] C _____

[8] C _____

[9] D _____

- [4] \overline{AB} and $\overline{A''B''}$ are graphed and labeled correctly, $A''(0,-5)$ and $B''(-2,0)$, and a correct transformation is identified, such as R_{180° , R_{-180° , or $r_{(0,0)}$.
- [3] One error is made in graphing \overline{AB} , but $\overline{A''B''}$ is graphed and labeled appropriately, and an appropriate transformation is identified.
- [2] \overline{AB} is graphed and labeled correctly but one mistake is made in finding $\overline{A''B''}$, but an appropriate transformation is identified.
- or [2] Both \overline{AB} and $\overline{A''B''}$ are graphed and labeled correctly, but the transformation is missing or is incorrect.
- [1] \overline{AB} is graphed and labeled correctly, but one mistake is made in finding $\overline{A''B''}$, and the transformation is missing or is incorrect.
- or [1] One error is made in graphing \overline{AB} , but $\overline{A''B''}$ is graphed and labeled appropriately, but the transformation is missing or is incorrect.
- or [1] R_{180° , R_{-180° , or $r_{(0,0)}$, but no graph is drawn.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [10] _____

- [4] Both equations are graphed correctly and the description of the transformation $a \rightarrow b$ is correct, such as $T_{(4,3)} \circ r_{x\text{-axis}}$ or $r_{y=3} \circ T_{(4,3)}$ or $T_{(4,3)} \circ R_{180^\circ}$ or an equivalent explanation, such as a shift right of 4 followed by a reflection over the x -axis followed by a shift up of 3.
- [3] Both equations are graphed correctly, but only one transformation is shown or described correctly.
- [2] Both equations are graphed correctly, but no further correct work is shown.
- [1] Only one equation is graphed correctly, and no composition formula or explanation is shown.
- or [1] The correct composition formula or explanation is shown, but no graphs or incorrect graphs are drawn.
- or [1] Both equations are graphed incorrectly, but an appropriate composition formula or explanation is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [11] _____
- [12] A _____
- a [2] The equation $2y = 2x^2 - 4$ is graphed correctly over the required interval and labeled.
- [1] An appropriate graph is shown, but less than the required interval is drawn.
- or [1] An appropriate graph is shown, but one coordinate is calculated incorrectly.
- b [2] A correct composition of transformations of the graph drawn in part a is sketched and labeled.
- [1] Only one of the transformations is correct.
- or [1] The composition of transformations is correct, but done in reverse order.
- a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- [13] _____

[3] Yes, A'' is $(1,-3)$ and B'' is $(2,-1)$ and appropriate work is shown, algebraically or graphically.

[2] Correct coordinates for A'' and B'' are found, but no conclusion is shown.

or [2] Either A'' or B'' is correct, and an appropriate conclusion is shown.

or [2] One transformation is correct and one is incorrect, such as the reflection in y , but an appropriate conclusion is shown.

[1] Neither transformation is correct, but an appropriate conclusion is shown.

or [1] One transformation is correct.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[14] incorrect procedure.