

The steps below show how a student solved an equation.

- Step 1: $4x - 7 = x + 5$
- Step 2: $4x - 7 + (-x) = x + 5 + (-x)$
- Step 3: $(4x - x) - 7 = (x - x) + 5$
- Step 4: $3x - 7 = 5$
- Step 5: $3x - 7 + (-7) = 5 + (-7)$
- Step 5: $3x = -2$
- Step 6: $x = -\frac{2}{3}$

a. In which step did the student make a mistake? Describe the mistake made.

In step 5, the student
"adds negative 7" to both sides
but this will not cancel -7.

The student should have added
7 to both sides.

b. Solve the equation correctly, justifying each step of your work.

$$\begin{array}{r} 4x - 7 = x + 5 \\ -x \quad -x \end{array} \quad \text{Addition PoE}$$

$$\begin{array}{r} 3x - 7 = 5 \\ +7 \quad +7 \end{array} \quad \text{Addition PoE}$$

$$\frac{3x}{3} = \frac{12}{3} \quad \text{Division PoE}$$

$$x = 4$$

2. (AREIB3) Solve the equation below for **b**. **Box** your answer.

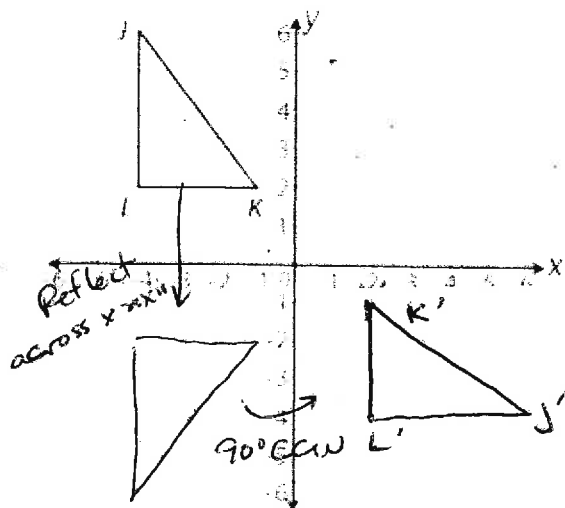
$ax - by = c$	Justification
$-ax \quad -ax$	Subtraction PoE
$\frac{-by}{-y} = \frac{c - ax}{-y}$	Division PoE
$b = \frac{c - ax}{-y}$	
<div style="border: 1px solid black; padding: 5px; display: inline-block;">$b = \frac{c - ax}{-y}$</div>	

2. (AREIB3) Solve the equation below and justify each step. Box and check your answer.

$-2(4x - 8) + 2x = -5x + 10$	Justification
$\begin{aligned} (-8x) + 16 + 2x &= -5x + 10 \\ -6x + 16 &= -5x + 10 \\ -16 \quad -16 & \\ -6x &= -5x - 6 \\ +5x \quad +5x & \\ -x &= -6 \\ \frac{-x}{-1} = \frac{-6}{-1} & \\ x &= 6 \end{aligned}$	<p>Distributive Property</p> <p>Combine Like Terms</p> <p>Subtraction PoE</p> <p>Addition PoE</p> <p>Division PoE</p>
$x = \underline{6}$	<p>Check your work here.</p> $\begin{aligned} -2(4(6) - 8) + 2(6) &= -5(6) + 10 \\ -2(24 - 8) + 12 &= -30 + 10 \\ -2(16) + 12 &= -20 \\ -32 + 12 &= -20 \\ -20 &= -20 \\ &\checkmark \end{aligned}$

3. (GC05) Draw and label the new figure given the transformations listed below.

The figure below shows $\triangle JKL$ on a coordinate plane.



- Reflect across the x-axis
- Rotated 90 degrees counter - clockwise

$$\begin{array}{l}
 J(-4, 6) \xrightarrow{\text{Reflect } y\text{-axis}} (-4, -6) \xrightarrow{\text{Rotation } 90^\circ \text{CCW}} (6, -4) \\
 K(-1, 2) \xrightarrow{\quad\quad\quad} (-1, -2) \xrightarrow{\quad\quad\quad} (2, -1) \\
 L(-4, 2) \xrightarrow{\quad\quad\quad} (-4, -2) \xrightarrow{\quad\quad\quad} (1, -4)
 \end{array}$$

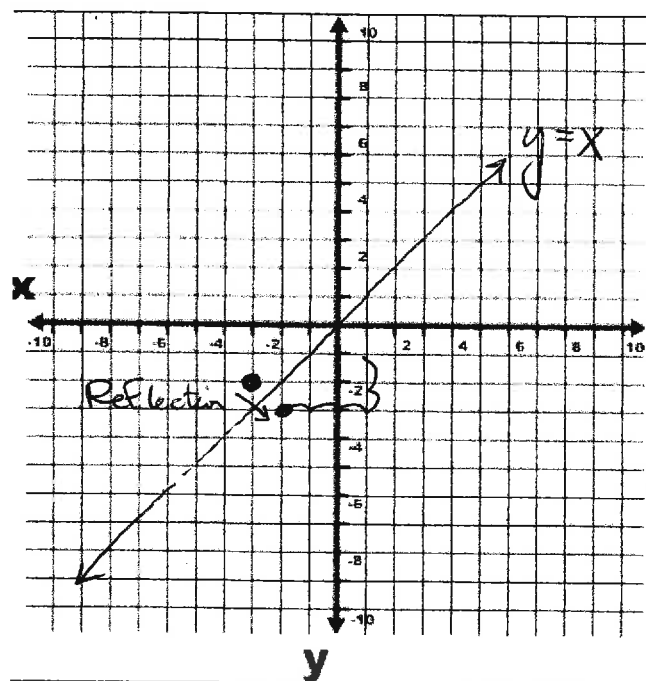
4. (GC05) Show your work and circle the best possible answer for the problem below.

A point at $(-3, -2)$ is transformed in two steps.

- It is reflected about $y = x$.
- It is translated 3 units right and 2 units up.

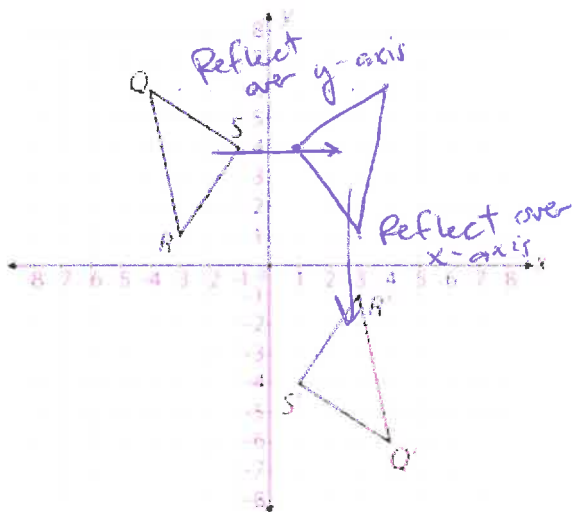
What is the location of the transformed point?

- A. $(1, -1)$
- B. $(-2, -3)$
- C. $(0, 0)$
- D. $(6, 4)$



5. (GC06) Verify that your answer choice is correct by drawing the transformations on the graph, using arrows to label each step.

The coordinate plane below shows the image of triangle QRS after it was first reflected across the x -axis, and then reflected across the y -axis.

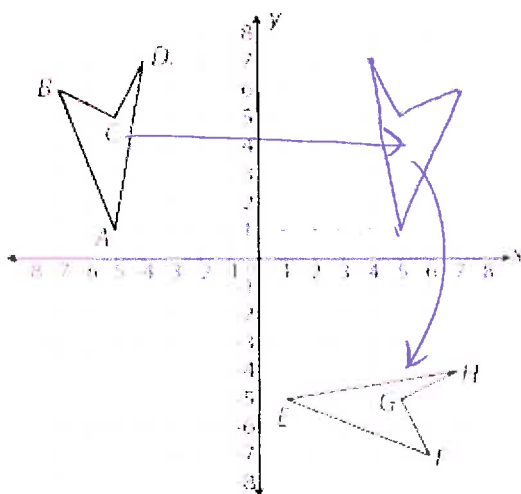


Which of these transformations has the same result?

- A. Reflect triangle QRS across the y -axis and then reflect it across the x -axis.
- B. Reflect triangle QRS across the x -axis and then translate it 2 units in a positive x direction.
- C. Rotate triangle QRS 90 degrees in a clockwise direction and then reflect it across the x -axis.

6. (GC06) Circle the best possible answer(s).

On the coordinate plane below, polygon $ABCD$ has been transformed to form $EFGH$.



Which of these could be the transformation? Choose all that are correct.

- A. A rotation 90 degrees counter-clockwise about the origin, then a reflection across the y -axis.
- B. A rotation 90 degrees clockwise about the origin, then a reflection across the x -axis.
- C. A rotation of 180 degrees about the origin.
- D. A reflection across the x -axis, then a reflection across the y -axis.