

1. (AREIA1) Answer the question below.

The steps in the solution to an equation are shown in the table.

Given:	$\frac{2}{3} + x = \frac{4-x}{2} + 3x$
Step 1:	$4 + 6x = 3(4-x) + 18x$
Step 2:	$4 + 6x = 12 - 3x + 18x$
Step 3:	$-9x = 8$
Step 4:	$x = -\frac{8}{9}$

What is the justification for the math used to complete each step?

Step 1: Multiplication PoE (by 6)

Step 2: Distributive Prop

Step 3: Subtraction Property of Equality

Step 4: Division Property of Equality

2. (AREIA1)

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.

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

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

$$\begin{array}{r} 3x = 12 \\ 3 \quad 3 \end{array} \quad \text{Division PoE}$$

$$x = 4$$

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

$$-2(4x - 8) + 2x = -5x + 10$$

$$\cancel{-8x} + 16 + \cancel{2x} = -5x + 10$$

$$-6x + 16 = -5x + 10$$

$$+6x \qquad +6x$$

$$16 = x + 10$$

$$-10 \qquad -10$$

$$\boxed{6 = x}$$

Distributive Property

Combine Like Terms

Addition Property of Equality

Subtraction Property of Equality

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

$$\cancel{ax} - by = c$$

$$-ax \qquad -ax$$

$$\cancel{+by} = \frac{c - ax}{-y}$$

$$+y \qquad -y$$

$$\boxed{b = \frac{c - ax}{-y}}$$

$$-2(4(6) - 8) + 2(6) = -5(6) + 10$$

$$-2(24 - 8) + 12 = -30 + 10$$

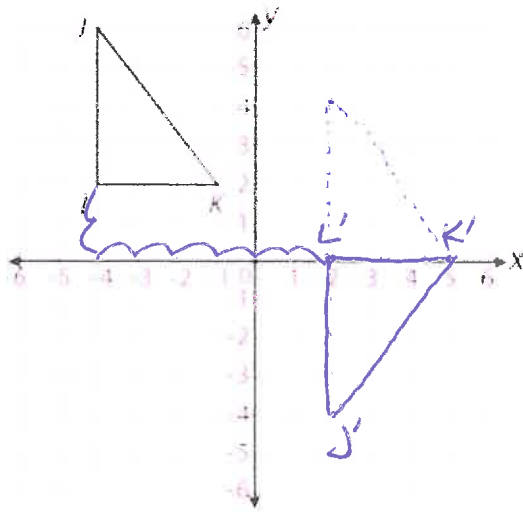
$$-2(16) + 12 = -20$$

$$-32 + 12 = -20$$

$$-20 = -20 \checkmark$$

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

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



- Translate 2 units in a negative y-direction
- Translate 6 units in a positive x-direction
- Reflect across the x-axis

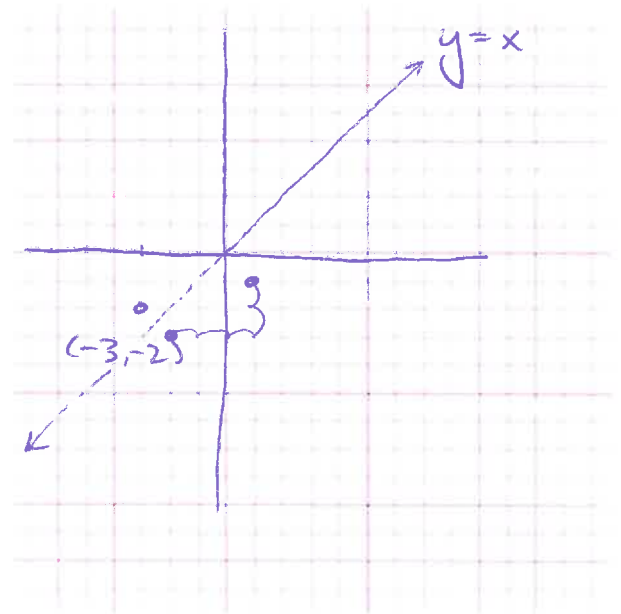
6. (GC05) Show your work and circle the best possible answer for the problem below.

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.

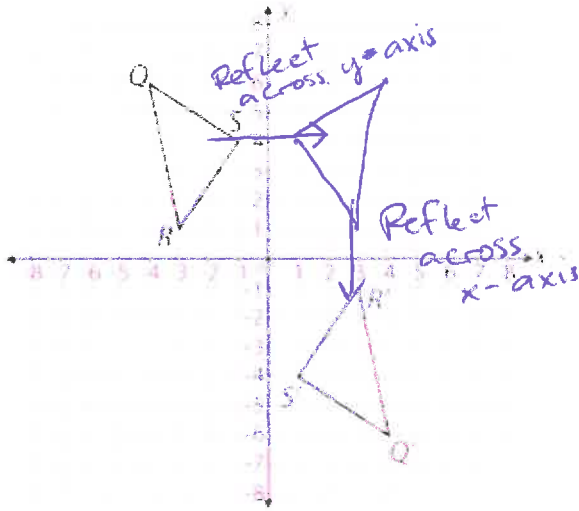
What is the location of the transformed point?

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



7. (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.



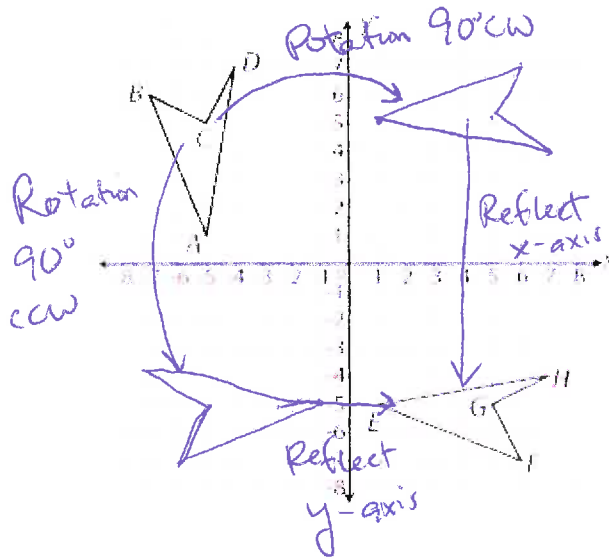
Which of these transformations has the same result?

- 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.
- D. Translate triangle QRS in a negative y direction 7 units and then reflect it across the x -axis

Which of these transformations has the same result?

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

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° counter-clockwise about the origin, then a reflection across the y -axis
- B. A rotation 90° clockwise about the origin, then a reflection across the x -axis
- C. A rotation of 180° about the origin
- D. A reflection across the x -axis, then a reflection across the y -axis
- E. A reflection across the line $y=x$
- F. A reflection across the line $y=-x$, then a rotation 180° about the origin

Oo6!

I missed a correct answer!