1. (AREIA1) Answer the question below.

Carmen is asked to solve this linear equation for x. She completes these steps.

Original equation: $-\frac{1}{4}(x+4) = -\frac{3}{4}x + 2$

Step 1: $-\frac{1}{4}x - 1 = -\frac{3}{4}x + 2$

Step 2: $\frac{2}{4}x - 1 = 2$

Step 3: $\frac{2}{4}x = 2 + 1$

Step 4: $\frac{1}{2}x = 3$

Step 5: $x = 6$

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

Step 1: Distributive Property

Step 2: Addition PoE

Step 3: Addition PoE

Step 4: Combine Like Terms (or "Simplify")

Step 5: Multiplication PoE (by 2) or Division PoE (by 1/2)

2. (AREIA1) Circle your answer. Then, explain your answer choice in the space below.

Jayden correctly solved the equation below.

$$\frac{x}{3} - 2 = \frac{1}{4}$$

Which of the following is a valid first step in the solution process?

(A) Multiply the equation by 12 to get $4x - 24 = 3$.

B. Multiply the equation by 3 to get $x - 2 = \frac{3}{4}$.

C. Subtract 2 from each side to get $\frac{x}{3} = -\frac{7}{4}$.

D. Subtract $\frac{1}{4}$ from both sides of the equation to get $\frac{x}{3} - \frac{7}{4} = 0$.

12 is the Least Common Multiple of 3 and 4, so the denominators of both fractions would cancel by applying the Multiplication PoE.

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

$2(3x - 8) = 2(7x + 2)$

$6x - 16 = 14x + 4$ Distributive Prop.

$+16 \quad +16$ ~~Addition~~ PoE

$6x = 14x + 20$

$-14x \quad -14x$ Subtraction PoE

$\frac{-8x}{-8} = \frac{20}{-8}$ Division PoE

$\boxed{x = -2.5}$

$2(3(-2.5) - 8) = 2(7(-2.5) + 2$

$2(-7.5 - 8) = 2(-17.5 + 2$

$2(-15.5) = 2(-15.5)$

$-31 = -31$ ✓

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

$ax - by = c$

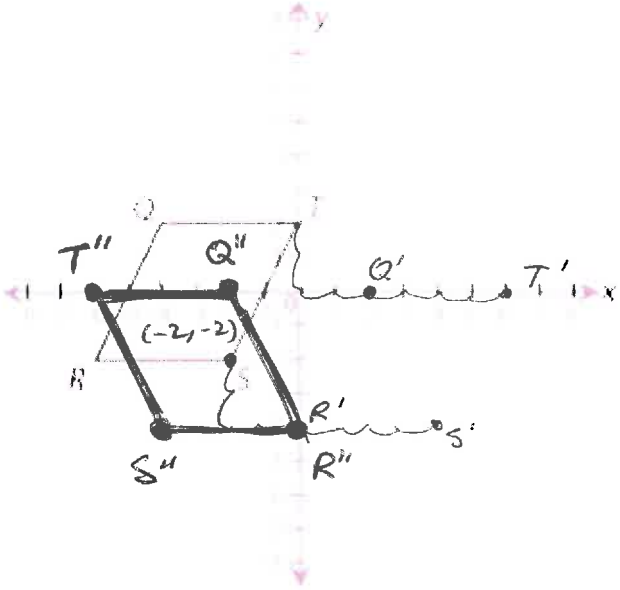
$+by \quad +by$

$\frac{ax}{x} = \frac{c + by}{x}$

$\boxed{a = \frac{c + by}{x}}$

5. (GCO5) Draw and label the new parallelogram given the transformations listed below.

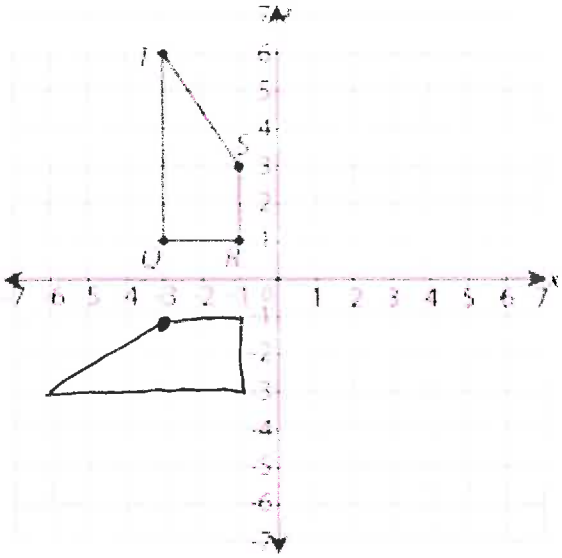
A parallelogram is shown on the coordinate plane below.



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

6. (GCO5) Draw on the coordinate grid below and then write your answer.

Trapezoid $QRST$ is shown below



The trapezoid is rotated 90° ~~clockwise~~ about the origin. What are the coordinates of the image of point T?

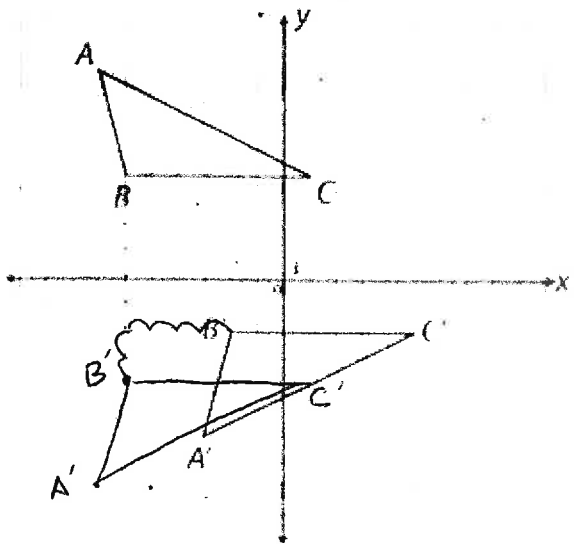
The trapezoid is rotated 90 counter-clockwise about the origin. What are the coordinates of the image of point S?

$S' = (-3, -1)$

$S(-1, 3) \xrightarrow[90° CCW]{(-y, x)} S''(-3, -1)$

7. (GCO6) Answer the question below in complete sentences and neatly draw the correct transformations on the grid below.

Look at the two triangles on the coordinate grid below.



Two students, Jerry and Teresa, are trying to figure out how many transformations it would take to move triangle *ABC* onto triangle *A'B'C'*.

Jerry thinks it will take two transformations to map triangle *ABC* onto triangle *A'B'C'*. Teresa thinks it will take three or more transformations to map triangle *ABC* onto triangle *A'B'C'*.

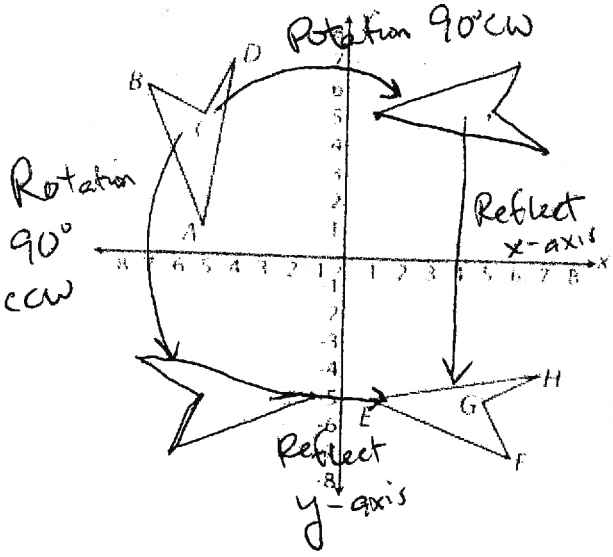
Which student is correct? Explain how you know that student is correct. Make sure you include the transformations.

Answers may vary

Teresa is correct. The three transformations are (1) reflection across the x-axis (2) translate 4 units to the right and (3) translate 2 units up.

8. (GCO6) 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

Ooof!

I missed a correct answer!