8.10 (C)

Explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation

<1 min

Fluency Practice

- 5 x (-9) =
- 18 + (-17) =
- (-4) x (-10) =
- (-3) x (-3) =
- (-8) – 3 =

If each point is shifted to the right by 3 units, what are the new points?

- (-3, 6) ->
- (12, 8) ->
- (-9, -8) ->

2 min

Problem Solving Strategies

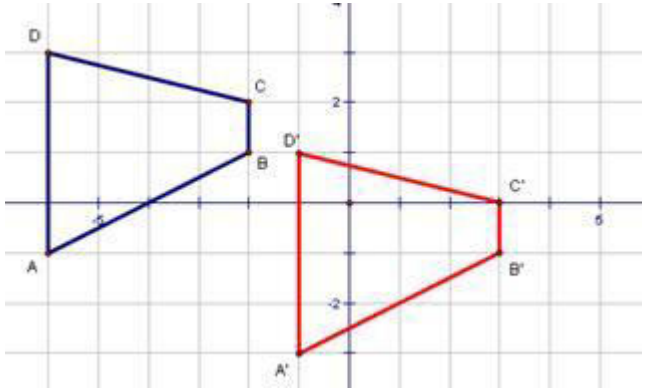
- **1. Understand the Problem**
  - Read the problem carefully (at least 2 to 3 times)
  - Highlight important information (what do I know)
  - Identify Math Clue words (words that tell you what math operations you need to use)
  - Underline what you need to find
- **2.Plan of Action (how you will solve this problem in steps)**
  - First I will
  - Then I will
  - Next I will
  - Finally, I will
- **3. Show your work in steps (solve using your steps)**
- **4. Check your answer (does my answer make sense? why)**

<3 min

Lesson

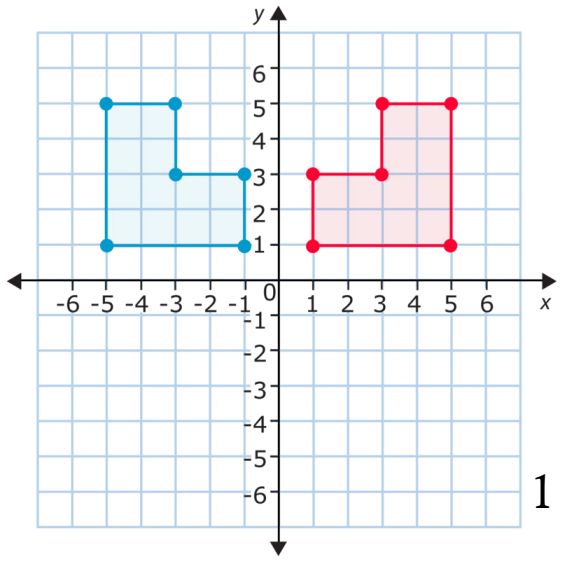
Translation

- When a shape is slid to a new location in space, it is called a **translation**



Reflection

- When a shape is flipped over a line, it is known as a **reflection**.

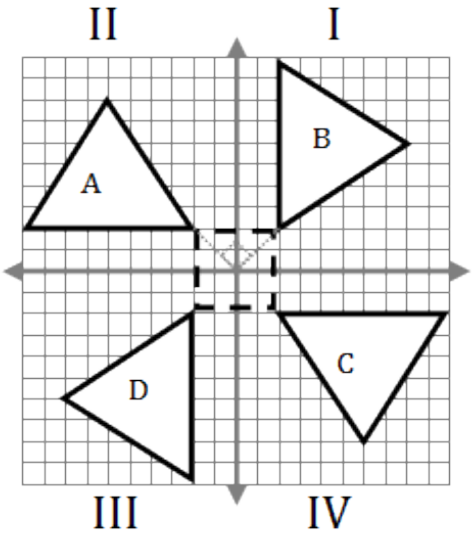


1 min

Lesson

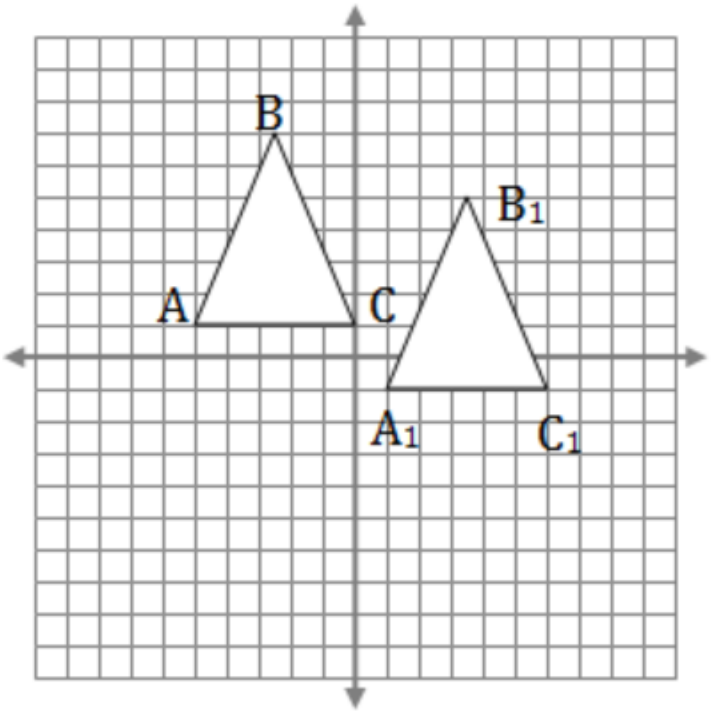
Rotation

- When a shape is turned, it is called a **rotation**



1 min

Translation



Coordinates of ΔABC are:
(-5,1); (-2.5,7); (0,1)

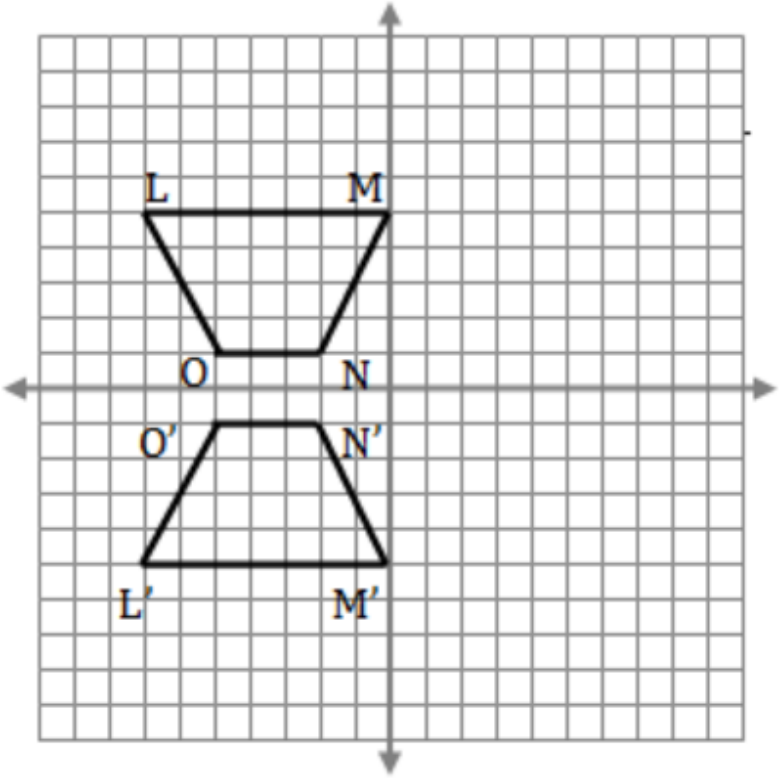
Translate 6 units to the right and 2 units down

A^1 = (-5 + 6, 1 - 2) = (1,-1)

B^1 = (-2.5 + 6, 7 - 2) = (3.5,5)

C^1 = (0 + 6, 1 - 2) = (6,-1)

Reflection

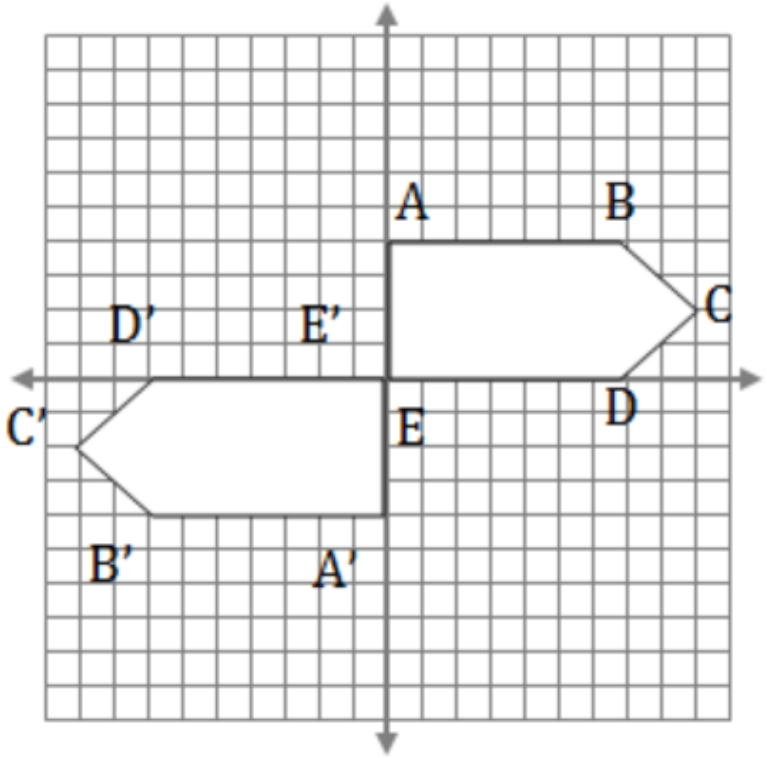


The coordinates of LMNO are:
(-7,5); (0,5); (-2,1); (-5,1)

LMNO is reflected over the X-axis making the coordinates of $L^1M^1N^1O^1$:
(-7,-5); (0,-5); (-2,-1); (-5,-1)

Note how the x-coordinates remain the same but the y-coordinates change to their opposite integer (i.e. the sign changes). This is always the case with reflections over the X-axis.

Rotation



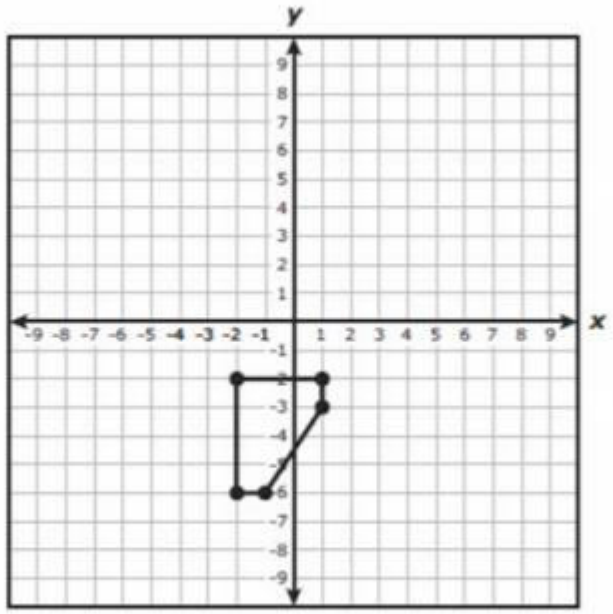
The coordinates of Pentagon ABCDE are:
(0,4); (7,4); (9,2); (7,0); (0,0)

Pentagon ABCDE is rotated 180° about the origin making the coordinates of Pentagon $A^1B^1C^1D^1E^{1:}$
(0,-4); (-7,-4); (-9,-2); (-7,0); (0,0)

Note how the coordinates of corresponding vertices are opposite integers (just the +/- sign is different). This is always the case with 180° rotations about the origin.

I Do

21 A figure is graphed on a coordinate grid as shown.



A $(x, y) \rightarrow (-x, -y)$

B $(x, y) \rightarrow (x, -y)$

C $(x, y) \rightarrow (-y, -x)$

D $(x, y) \rightarrow (-x, y)$

The figure is rotated 180° clockwise with the origin as the center of rotation to create a new figure. Which rule describes this transformation?

<5 min

We do - Question 1

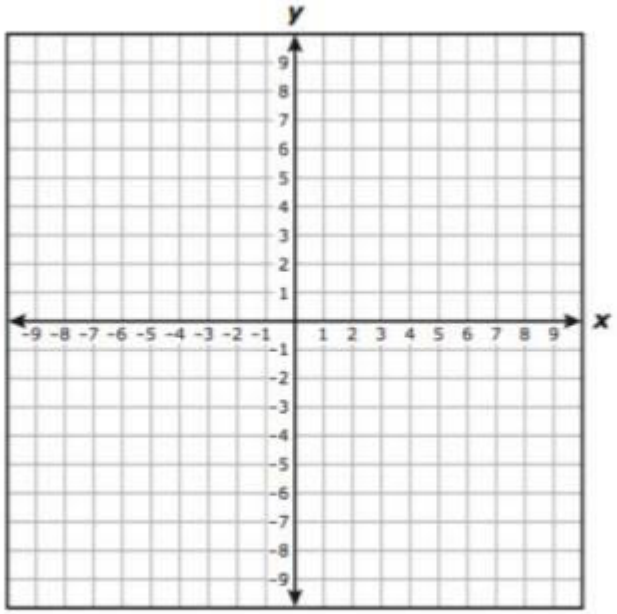
The coordinates of the vertices of a quadrilateral are $P\,(1, 2)$, $R\,(1, 4)$, $S\,(3, 4)$, and $T\,(4, 2)$.

A $(x, y) \rightarrow (x, -y)$

B $(x, y) \rightarrow (-x, y)$

C $(x, y) \rightarrow (y, -x)$

D $(x, y) \rightarrow (-y, x)$



Quadrilateral *PRST* is reflected across the *y*-axis to create quadrilateral *P'R'S'T'*. Which rule describes this transformation?

<5 min

We Do – Question 2

Triangle *ABC* was translated 2 units to the right and 3 units down. Which rule describes the translation that was applied to triangle *ABC* to create triangle *A′B′C′*?

F $(x, y) \rightarrow (x - 3, y + 2)$

G $(x, y) \rightarrow (x + 2, y - 3)$

H $(x, y) \rightarrow (2x, -3y)$

J $(x, y) \rightarrow (-3x, 2y)$

<5 min

We do - Question 3

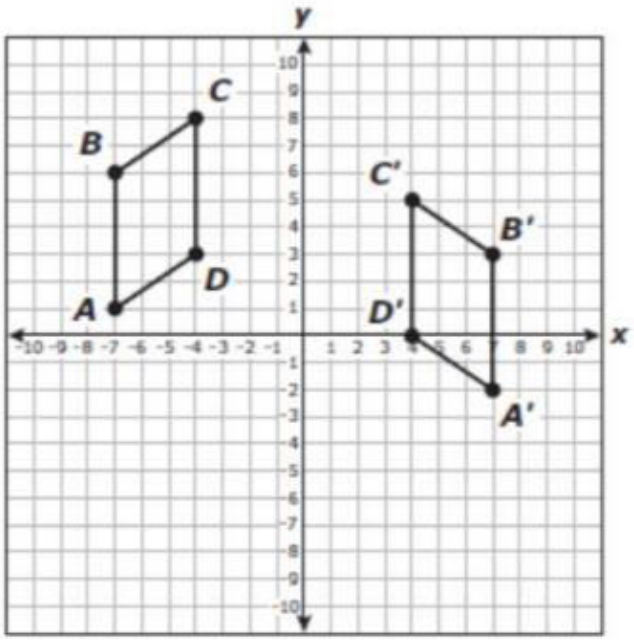
Parallelogram $ABCD$ was transformed to form parallelogram $A'B'C'D'$.

F $(x, -y)$

G $(-x, y)$

H $(x + 6, -y)$

J $(-x, y - 3)$



Which rule describes the transformation that was used to form parallelogram $A'B'C'D'$?

<5 min

We do - Question 4

A circle is graphed on a coordinate grid and then reflected across the y-axis. If the center of the original circle was located at (x, y), which ordered pair represents the center of the new circle after the transformation?

A (x, y)

B $(x, -y)$

C $(-x, y)$

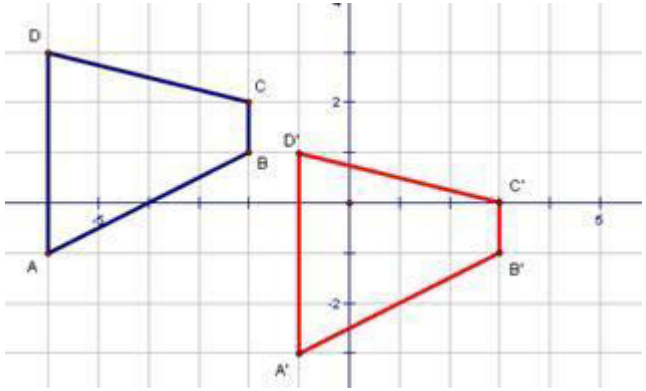
D $(-x, -y)$

<5 min

Lesson

Translation

- When a shape is slid to a new location in space, it is called a **translation**



Reflection

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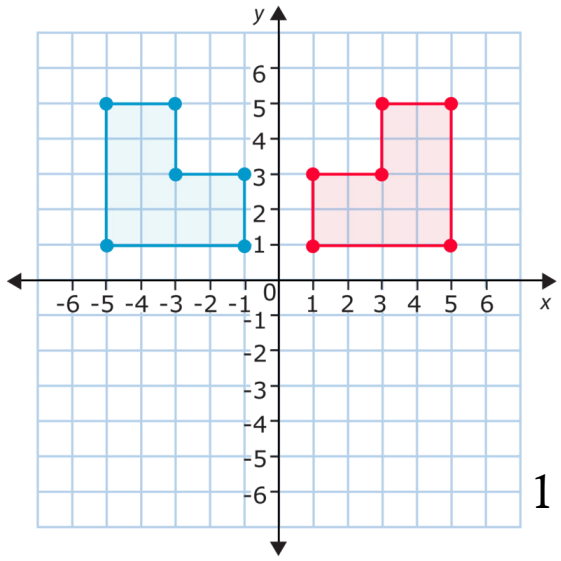
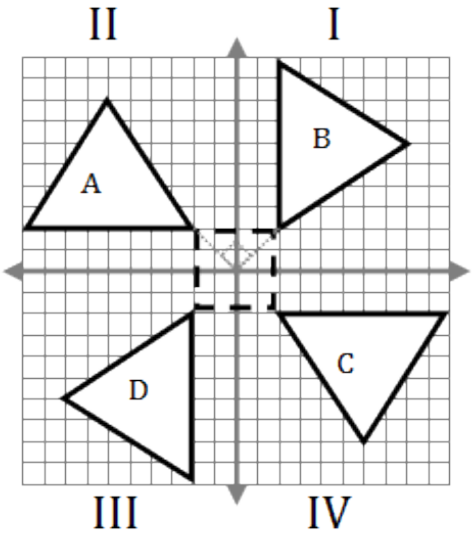


1 min

Lesson

Rotation

- When a shape is turned, it is called a **rotation**



1 min

You Do

- Go back to Intervene to take your quiz!