Week 1 Friday Course 3 Warm-up

Sam bought a total of 25 hamburgers and hot dogs. His total bill was $70.50. If each hamburger cost $3 and each hot dog cost $2.50, how many hot dogs did Sam buy?

Finding Functions

An input-output table for the function $y = -5x + 15$ is shown below. Use the table to determine which value of x solves the equation $-5x + 15 = 0$.

input (x)	output (y)
-3	30
-1	20
0	15
1	10
3	0

A) -3

B) 0

C) 1

D) 3

A 25 foot ladder is leaning against the side of a house. If the bottom of the ladder is 7 feet from the side of the house, how far up does the ladder reach on the house?

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A 25 foot ladder is leaning against the side of a house. If the bottom of the ladder is 7 feet from the side of the house, how far up does the ladder reach on the house?

24 feet

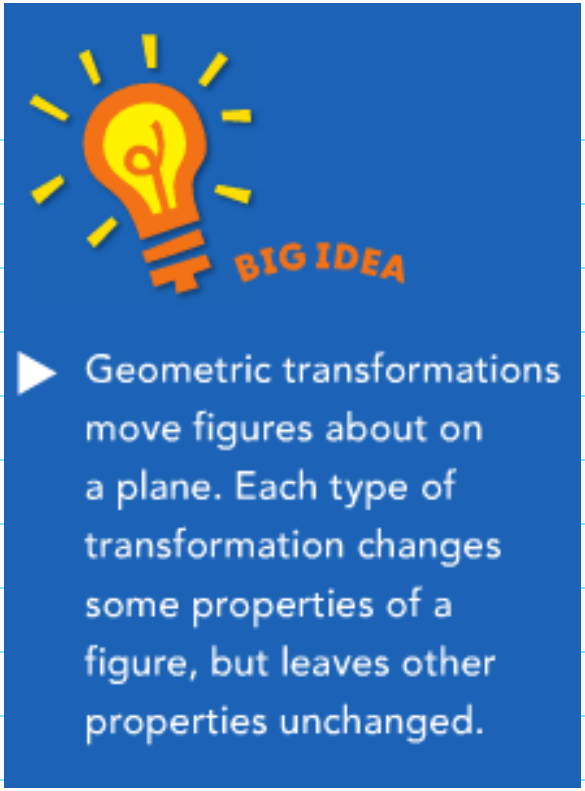
Lesson 8.2 Reflections Day 2

Objective

TSW understand concept of reflection

*drawing images after reflection

***find coordinates of points after reflection**



Common Core State Standards

8G1 Verify experimentally the properties of rotations, reflections, and translations.

8G1 a Lines are taken to lines, and line segments to line segments of the same length.

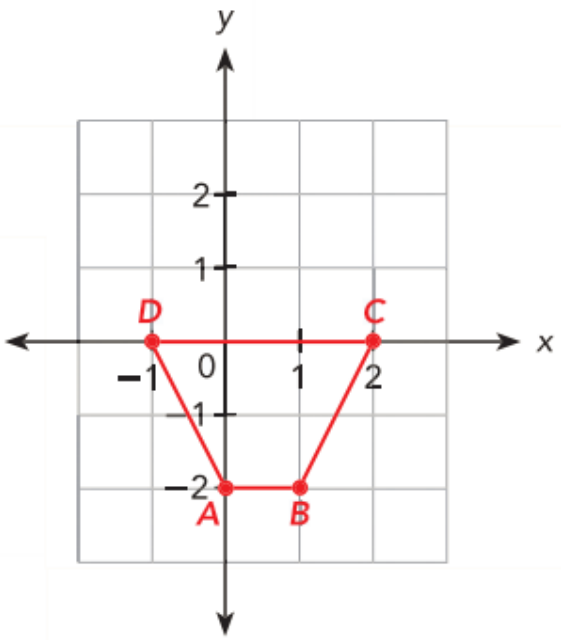
Mathematical Practices *MP3 Construct arguments MP 4 Model Mathematics MP5 Use tools strategically*

Lesson 8.2 Reflections Day 2

Example 7 Reflect a figure in the *x*-axis.

Susan placed a cup on a table. She then placed cardboard on top of the cup and another cup, upside down, on top of the cardboard. The side view of *ABCD*, the cup below the cardboard, is shown. The cardboard is aligned with the *x*-axis.

The side view of cup *A'B'C'D'* is the reflection of the side view of cup *ABCD*. Draw and label the side view of cup *A'B'C'D'*.

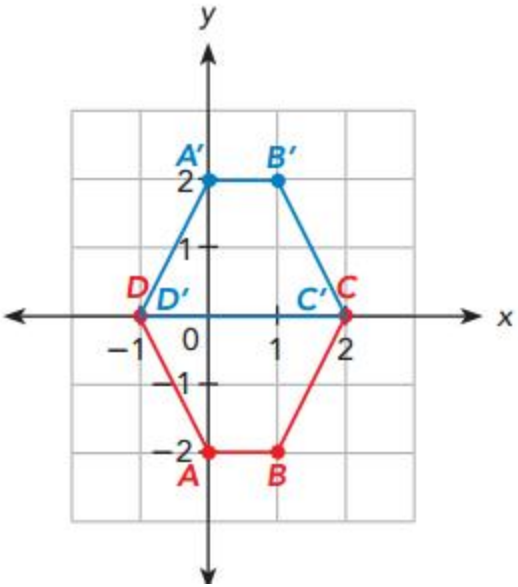


Lesson 8.2 Reflections Day 2

Solution

$A'B'C'D'$ is the reflection of $ABCD$ in the x-axis.

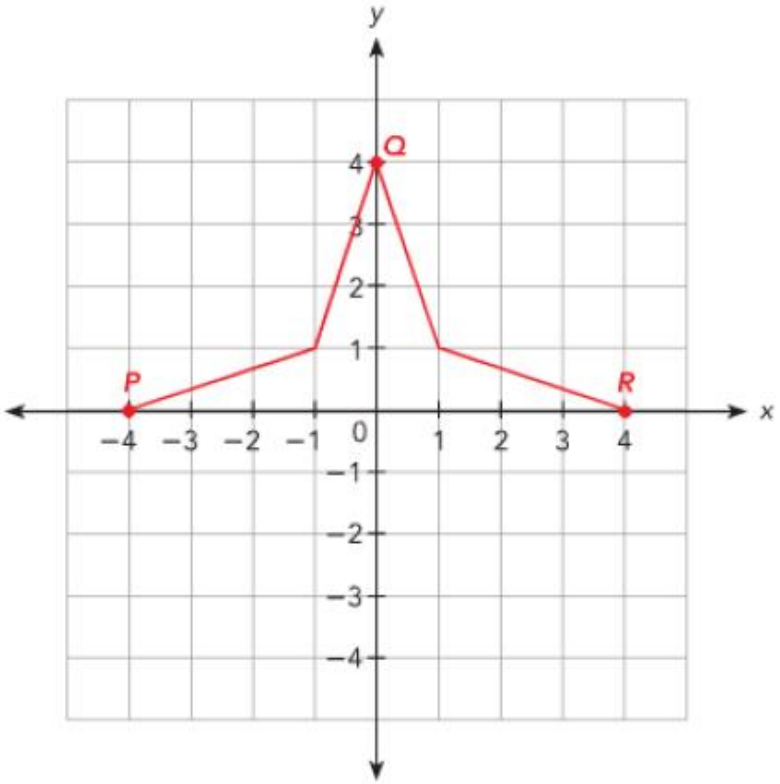
Vertices	Distance from the x-axis
A and A'	2
B and B'	2
C and C'	0
D and D'	0



The x-coordinates of each point of $ABCD$ and of its image $A'B'C'D'$ are the same. The y-coordinates are opposites. That is, (x, y) is mapped onto $(x, -y)$. The invariant points of this figure are all the points of $\overline{CD}$, because they are on the line of reflection.

Lesson 8.2 Reflections Day 2

3 Layla is designing a star-shaped figure for a stencil. She wants the bottom half to be a reflection of the top half. She will reflect it across the *x*-axis to draw the other half. Complete the design for her.



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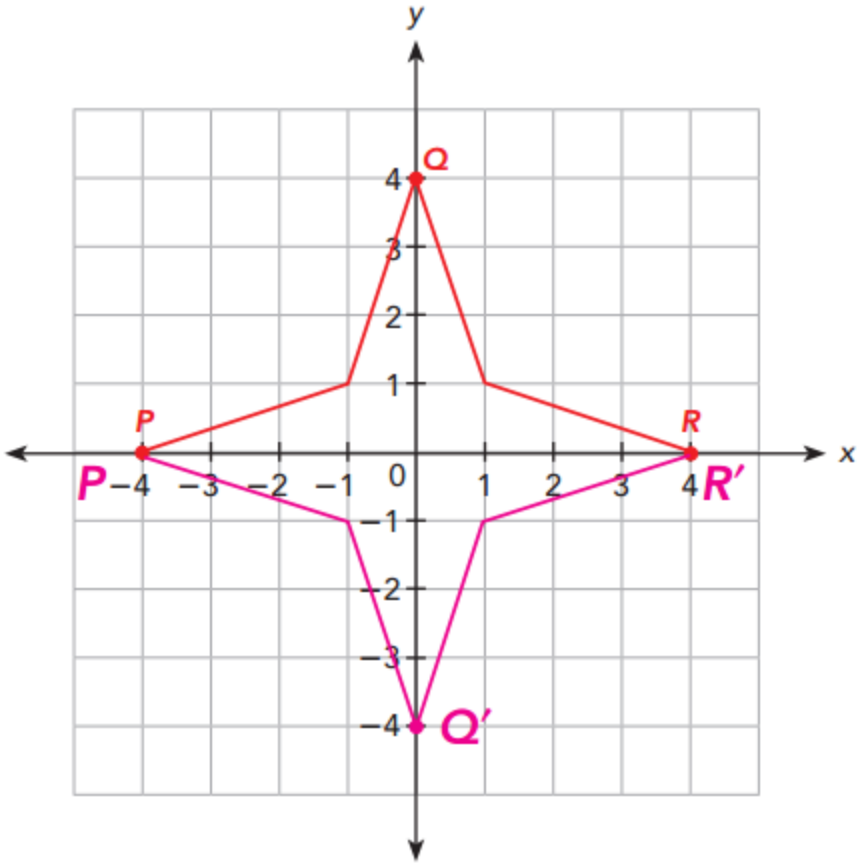


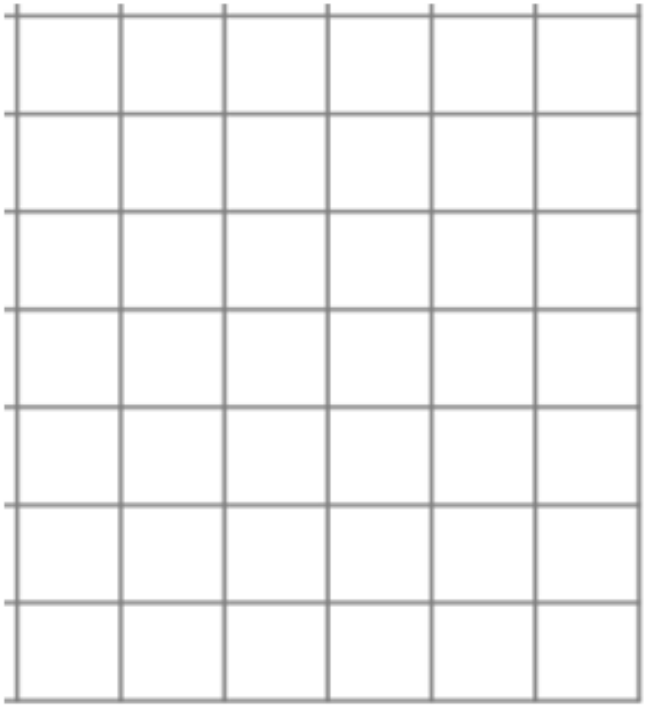
Lesson 8.2 Reflections Day 2

Example 8 **Reflect a figure in the *y*-axis.**

Ally draws a shape with the following coordinates for its vertices.

$A\,(0, 2)$, $B\,(2, 2)$, $C\,(2, 1)$, $D\,(1, 1)$, $E\,(1, -1)$, and $F\,(0, -1)$.

She reflects it in the *y*-axis to get an alphabet letter. Draw the letter on the coordinate plane.



Lesson 8.2 Reflections Day 2

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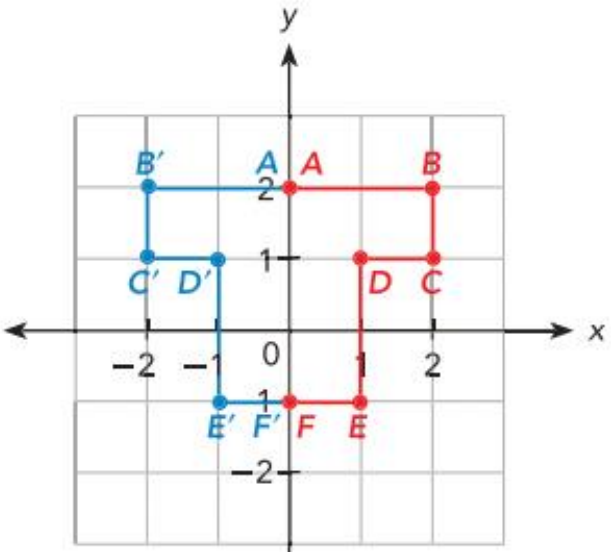
Solution



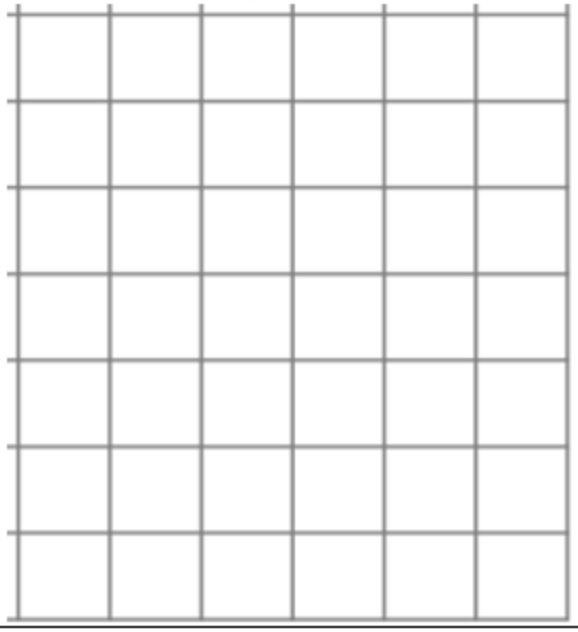
Points *A* and *F* are the invariant points of this figure because they are on the line of reflection. You can see that a reflection in the *x*-axis maps (x, y) onto $(x, -y)$ and a reflection in the *y*-axis maps (x, y) onto $(-x, y)$.

Lesson 8.2 Reflections Day 2

Guided Practice

Complete.

4 A figure with vertices $P\,(0, 2)$, $Q\,(-1, 0)$, $R\,(-2, 1)$, $S\,(-1, -2)$, and $T\,(0, -2)$ is reflected in the y-axis. Draw the figure and its image on the coordinate plane. Use 1 grid square on both axes to represent 1 unit for the interval from -2 to 2.



Lesson 8.2 Reflections Day 2

Guided Practice

Complete.

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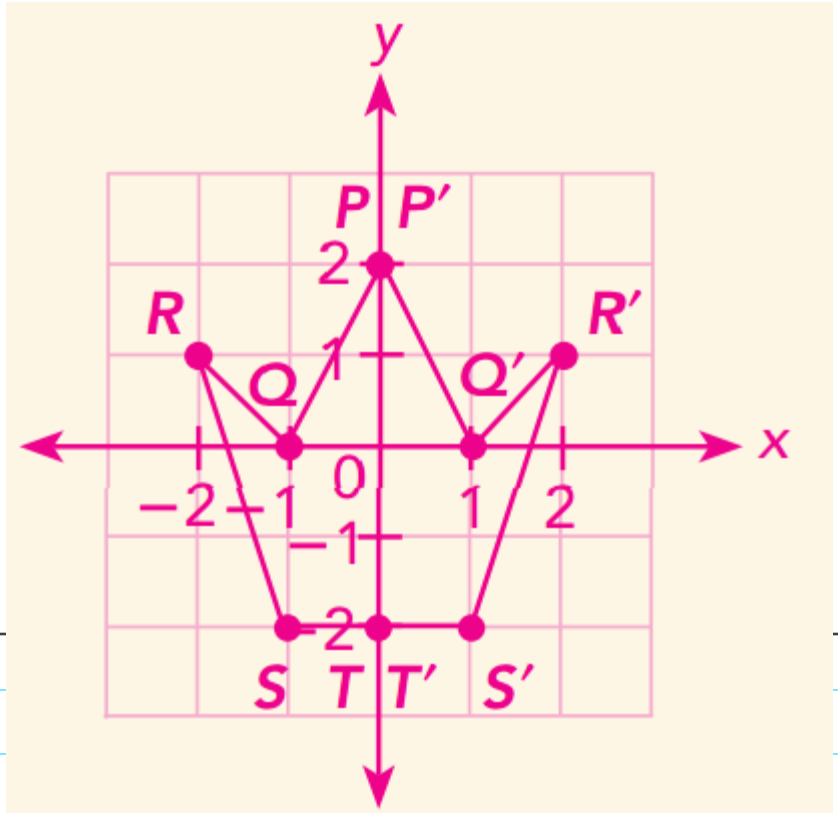


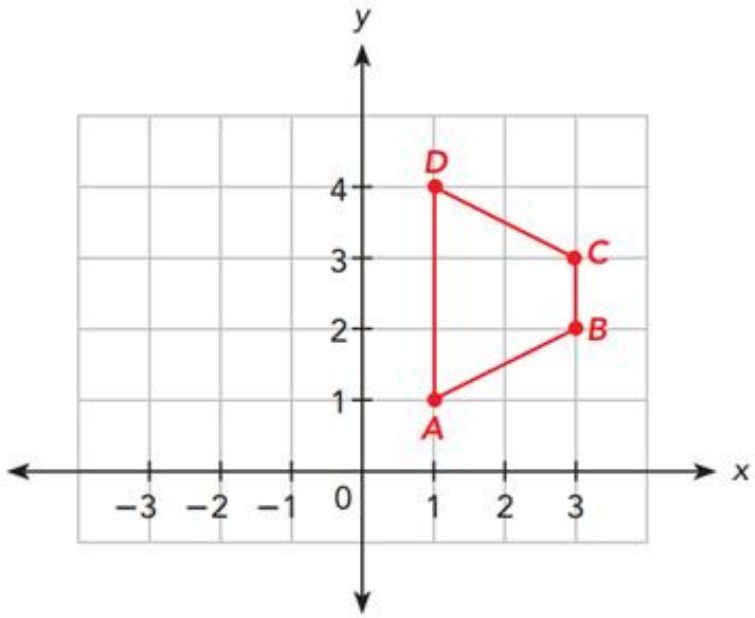
Lesson 8.2 Reflections Day 2

Example 9 **Find the coordinates of points after a reflection.**

State the coordinates of the points.

$A'B'C'D'$ is a reflection of $ABCD$ in the y-axis.

a) What are the coordinates of A, B, C, and D?



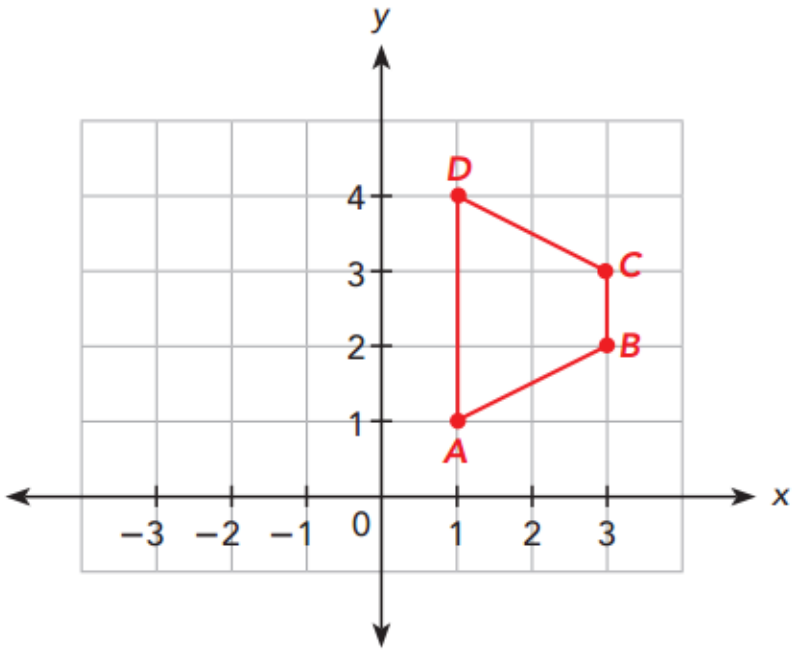
b) What are the coordinates of A', B', C', and D'?

Example 9 Find the coordinates of points after a reflection.

State the coordinates of the points.

$A'B'C'D'$ is a reflection of $ABCD$ in the y-axis.

a) What are the coordinates of A, B, C, and D?



Solution

The coordinates are A (1, 1), B (3, 2), C (3, 3), and D (1, 4).

b) What are the coordinates of A', B', C', and D'?

Solution

The coordinates are A' (−1, 1), B' (−3, 2), C' (−3, 3), and D' (−1, 4).

Each point and its image are the same distance from the line of reflection, the y-axis. For example, A and A' are each 1 unit from the y-axis. Their x-coordinates are opposites, and their y-coordinates are the same.

Lesson 8.2 Reflections Day 2

Guided Practice

Complete.

5 Mr. Patterson is building a double bird house, one next to the other. The vertices of the front of one houses have coordinates P (3, 0), Q (6, 3), R (3, 6), and S (0, 3). The front of the other bird house, $P'Q'R'S'$, is a reflection of the first one in the y-axis.

The x-coordinates of vertices of $PQRS$ and $P'Q'R'S'$ are ___?___, and their y-coordinates are ___?___.

P (3, 0) is mapped onto P' (___?___, ___?___).

Q (6, 3) is mapped onto Q' (___?___, ___?___).

R (3, 6) is mapped onto R' (___?___, ___?___).

S (0, 3) is mapped onto S' (___?___, ___?___).

Any point (x, y) is mapped onto (___?___, ___?___) when reflected in the y-axis.

Lesson 8.2 Reflections Day 2

Guided Practice

Complete.

5 Mr. Patterson is building a double bird house, one next to the other. The vertices of the front of one houses have coordinates P (3, 0), Q (6, 3), R (3, 6), and S (0, 3). The front of the other bird house, $P'Q'R'S'$, is a reflection of the first one in the y-axis.

The x-coordinates of vertices of $PQRS$ and $P'Q'R'S'$ are ___?___, and their y-coordinates are ___?___. opposites; the same

P (3, 0) is mapped onto P' (___?___, ___?___). −3; 0

Q (6, 3) is mapped onto Q' (___?___, ___?___). −6; 3

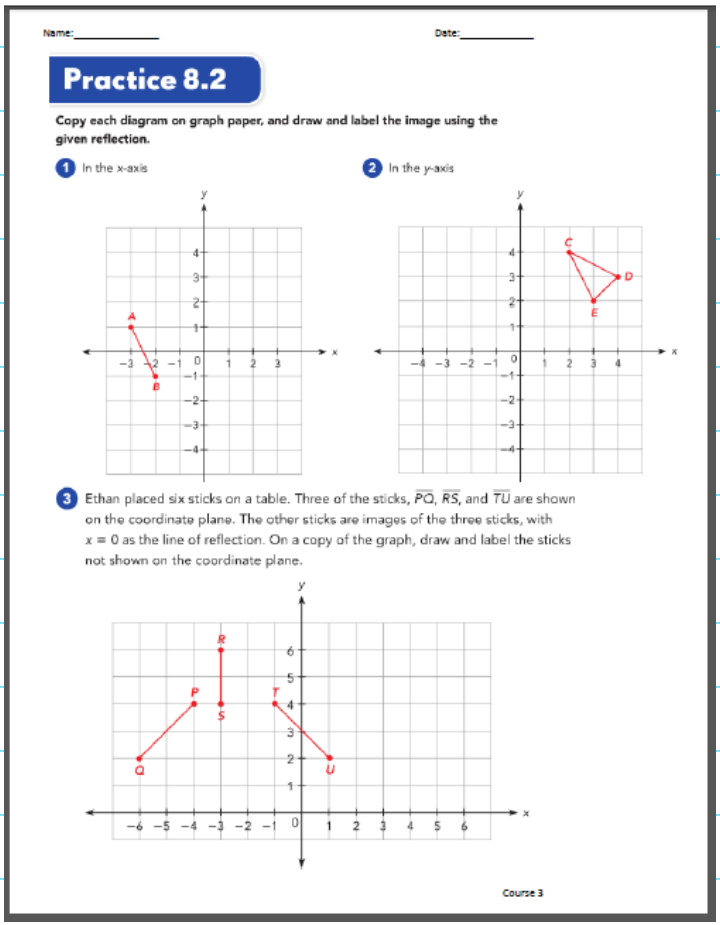
R (3, 6) is mapped onto R' (___?___, ___?___). −3; 6

S (0, 3) is mapped onto S' (___?___, ___?___). 0; 3

Any point (x, y) is mapped onto (___?___, ___?___) when reflected in the y-axis. $-x$; y

Lesson 8.2 Reflections Day 2

Practice 8.2 #2, 4-5



Name:_____ Date:_____

Practice 8.2

Copy each diagram on graph paper, and draw and label the image using the given reflection.

1. In the x-axis

2. In the y-axis

3. Ethan placed six sticks on a table. Three of the sticks, $\overline{PQ}$, $\overline{RS}$, and $\overline{TU}$ are shown on the coordinate plane. The other sticks are images of the three sticks, with $x = 0$ as the line of reflection. On a copy of the graph, draw and label the sticks not shown on the coordinate plane.

Course 3

Challenge-

*#8-9 provide challenge

*Solve created equations

"Pick a Snowflake"

*BuzzMath

Lesson Check #2- can reflect a figure, find the coordinates of the image of a point after a reflection in the x or y axis

Lesson 8.2 Reflections Day 2

Ticket Out the Door- Connect, Extend, Challenge

1. How are the ideas and information presented CONNECTED to what you already knew?

2. What new ideas did you get that EXTENDED or pushed your thinking in new directions?

3. What is still CHALLENGING or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?