

# Lesson 8.1 Translations Day 2

## Week 1 Wednesday Course 3 Warm-up



Elizabeth and Lauren sold cookies for a school fundraiser and made \$1,316.70 Together the girls sold a total of 831 cookies. Elizabeth sold chocolate chip cookies for \$ 1.50 each, and Lauren sold peanut butter cookies for \$1.65 each. How many cookies did Lauren sell?

### Finding Functions

Which graph shows  $y$  as a function of  $x$ ?

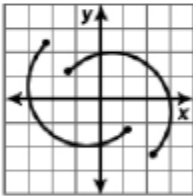


Figure 1

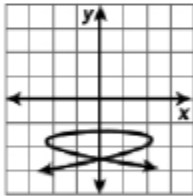


Figure 2

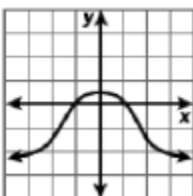


Figure 3

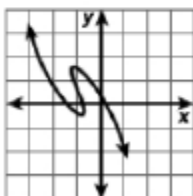
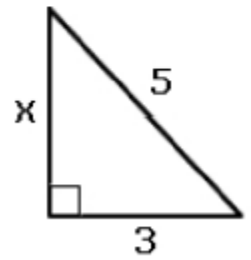


Figure 4

What is the value of  $x$  in the diagram below?



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468

### Finding Functions

Which graph shows  $y$  as a function of  $x$ ?

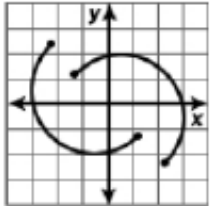


Figure 1

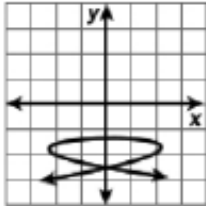


Figure 2

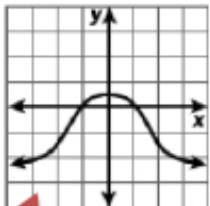


Figure 3

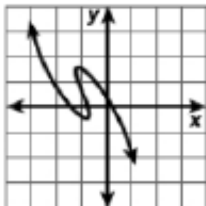
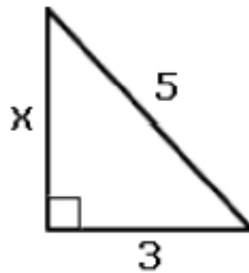


Figure 4

What is the value of  $x$  in the diagram below?



4

## Lesson 8.1 Translations Day 2



Create a consensus map to identify MC Escher's type of transformation (Use your vocabulary chart from yesterday)

## Lesson 8.1 Translations Day 2

# Objective

TSW understand concept of translations

\*drawing images after translation

**\*find coordinates of points after translation**

### 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*



▶ Geometric transformations move figures about on a plane. Each type of transformation changes some properties of a figure, but leaves other properties unchanged.

## Lesson 8.1 Translations Day 2

### Find the Coordinates of Points After Translations.

#### Example 4 Find the coordinates of points after translations.

A triangular block of concrete  $ABC$  at a construction site is to be relocated using the translation: 5 units to the right and 3 units down. The coordinates of  $A$ ,  $B$ , and  $C$  are given in the table. Find the coordinates of the relocated block  $A'B'C'$ . Then state the new coordinates for any point  $(x, y)$  under this translation.

Original Point	Is Mapped Onto
$A (1, 1)$	$A' (? , ?)$
$B (3, 1)$	$B' (? , ?)$
$C (2, 5)$	$C' (? , ?)$
$(x, y)$	$(? , ?)$

To find the coordinates of the block after the translation, add 5 units to the  $x$ -coordinate and subtract 3 units from the  $y$ -coordinate for each point.

## Solution

Original Point	Is Mapped Onto
$A (1, 1)$	$A' (6, -2)$
$B (3, 1)$	$B' (8, -2)$
$C (2, 5)$	$C' (7, 2)$
$(x, y)$	$(x + 5, y - 3)$

# Lesson 8.1 Translations Day 2

## Guided Practice

Complete.

4 A triangle has coordinates  $A(2, 1)$ ,  $B(3, 2)$ , and  $C(1, 4)$ . It is moved under the translation 2 units to the left and 3 units up. Find the coordinates of the image triangle  $A'B'C'$ . Then state the new coordinates for any point  $(x, y)$  under this translation.

Original Point	Is Mapped Onto
$A(2, 1)$	$A'(\underline{\quad?}, \underline{\quad?})$
$B(3, 2)$	$B'(\underline{\quad?}, \underline{\quad?})$
$C(1, 4)$	$C'(\underline{\quad?}, \underline{\quad?})$
$(x, y)$	$(\underline{\quad?}, \underline{\quad?})$

To find the coordinates of  $A'$ ,  $B'$ , and  $C'$ , subtract 2 units from the x-coordinate and add 3 units to the y-coordinate of  $A$ ,  $B$ , and  $C$ .



# Lesson 8.1 Translations Day 2

## Guided Practice

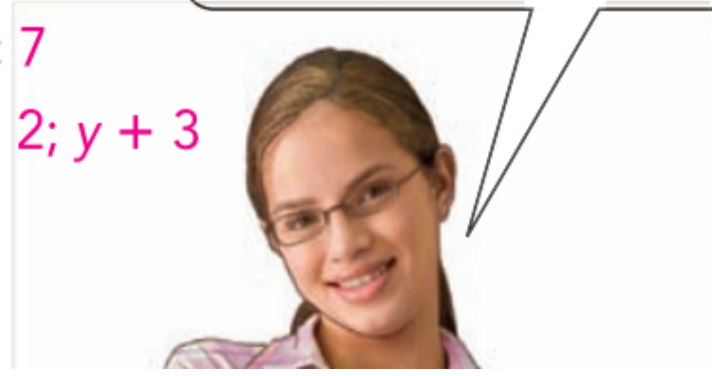
Complete.

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$A(2, 1)$	$A'(\underline{\quad?}, \underline{\quad?})$
$B(3, 2)$	$B'(\underline{\quad?}, \underline{\quad?})$
$C(1, 4)$	$C'(\underline{\quad?}, \underline{\quad?})$
$(x, y)$	$(\underline{\quad?}, \underline{\quad?})$

$0; 4$   
 $1; 5$   
 $-1; 7$   
 $x - 2; y + 3$

To find the coordinates of  $A'$ ,  $B'$ , and  $C'$ , subtract 2 units from the x-coordinate and add 3 units to the y-coordinate of  $A$ ,  $B$ , and  $C$ .





# Lesson 8.1 Translations Day 2

## Practice 8.1 #5 and 7-8

## Challenge-

\*#9-11 provide challenge

\*Solve created equations

“Pick a Snowflake”

\*BuzzMath

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Practice 8.1

Find the coordinates of the image under each translation.

- 1  $P(0, 2)$  is translated by 8 units to the left.
- 2  $Q(-3, 5)$  is translated by 3 units to the right and 10 units up.
- 3  $R(-4, -2)$  is translated by 1 unit to the left and 6 units up.

Copy each diagram on graph paper and draw the image under each translation.


- 4  $\overline{AB}$  is translated 5 units to the right and 1 unit down.
- 5 Triangle  $DEF$  is translated 3 units to the left and 2 units up.

Find the coordinates of each point using the given translation. Label the images on a coordinate plane.

- 6 Jon's apartment is located at  $A(2, 2)$ . He uses the translations described in a) to d) to visit each of his neighbors.
  - a) From  $A(2, 2)$ , translate by 3 units to the right, 2 units up to  $B$ .
  - b) From  $B$ , translate by 2 units to the left, 1 unit up to  $C$ .
  - c) From  $C$ , translate by 1 unit to the right, 2 units down to  $D$ .
  - d) From  $D$ , translate by 2 units to the left, 3 units down to  $E$ .

Course 3



 **Lesson Check #5**-can translate a figure AND can find the coordinates of an image point using addition

# 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?