

# Adding Integers

$$\text{+} + \text{+} = \text{+}$$

$$\text{-} + \text{-} = \text{-}$$

$$\text{+} + \text{-} = \text{+}$$

$$\text{+} + \text{-} = \text{-}$$

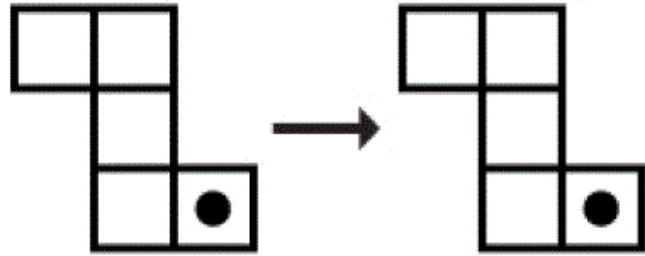
**BEFORE OUR  
SESSION BEGINS ...**

Play the Quizizz Game – *Adding Integers*.

Go to [joinmyquiz.com](https://joinmyquiz.com) and type in  
**Game Code# 49873984**

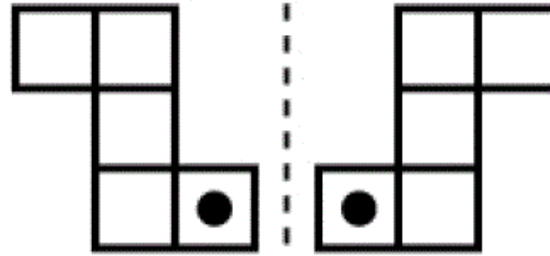
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**Meet Back Here at 8:06 a.m.**



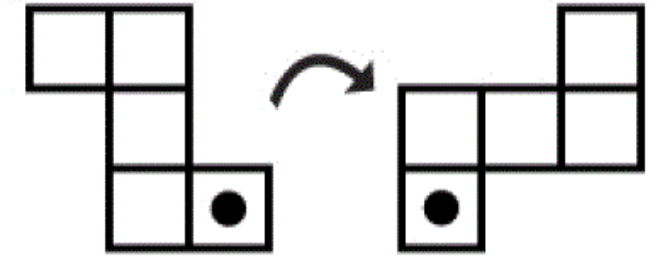
TRANSLATION

**SLIDES**



REFLECTION

**FLIPS**



ROTATION

**TURNS**

# THE RIGID MOTIONS

Any transformation that moves a figure without changing its size and shape.

# WARM-UP

- 1) Draw **4 coordinate planes** on the front of a sheet of graph paper.
- 2) Given  $T(-6, 2)$ ,  $A(-3, 6)$ , and  $B(-3, 2)$ , **draw  $\triangle TAB$  in each coordinate plane.**
- 3) **Reflect  $\triangle TAB$**  across the following lines of reflection:
  - Graph #1: Reflect across the **x-axis**.
  - Graph #2: Reflect across the **y-axis**.
  - Graph #3: Reflect across the **line  $y = x$** .
  - Graph #4: Reflect across the **line  $y = -2$** .

\*\*\**REMEMBER: Use apostrophes to label your image.*\*\*\*



If you drive a car around town, what types of transformations does the car undergo?

**GEOMETRY  
IN THE  
REAL WORLD**



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# ROTATION

A transformation that **turns** a figure about a fixed point through a given angle and given direction.

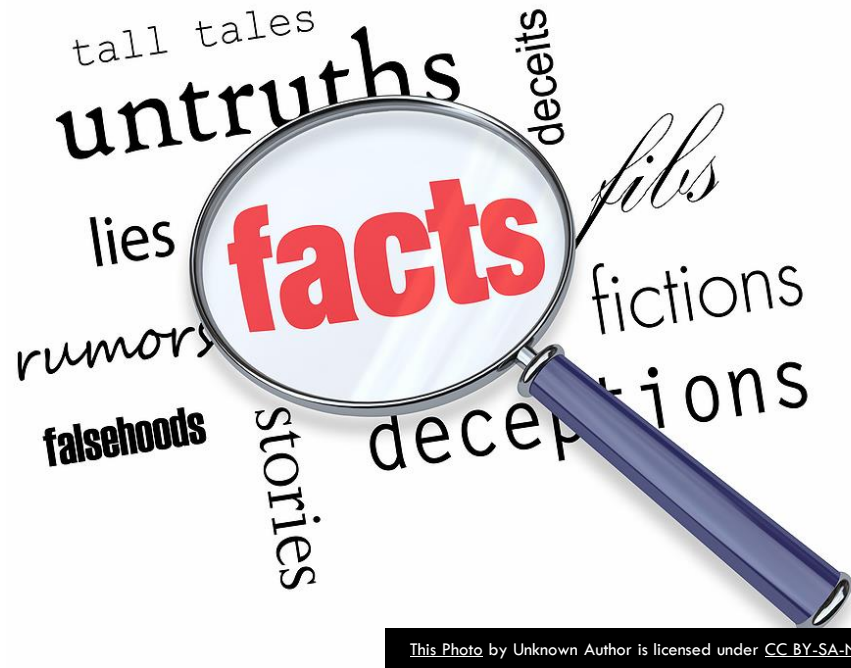


# ROTATIONS IN THE COORDINATE PLANE VIDEO

- 1) Watch the **first 4 minutes and 45 seconds** of the video.
- 2) Complete the **Video Response Sheet** while you are watching.



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Now, use what  
you learned to  
complete the  
**Rotations**  
**Classwork.**

**ROTATIONS**  
**MASHUP MATH VIDEO**

# TRANSFORMATION RULES

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# TRANSFORMATIONS

## TRANSLATION→SLIDE

Translate right→  $(x + \#, y)$

Translate left→  $(x - \#, y)$

Translate up→  $(x, y + \#)$

Translate down→  $(x, y - \#)$

## REFLECTION→FLIP

Across x-axis→  $(x, -y)$  Change the Sign of y

Across y-axis→  $(-x, y)$  Change the Sign of x

Across  $y = x$  →  $(y, x)$  Swap Both

Across  $y = -x$  →  $(-y, -x)$  Change Both Signs & Swap

## ROTATION→TURN

90 CW & 270 CCW →  $(y, -x)$  Change Sign of x & Swap

90 CCW & 270 CW →  $(-y, x)$  Change Sign of y & swap

180 either way →  $(-x, -y)$  Change Both Signs



# ROTATE $90^\circ$ COUNTERCLOCKWISE ABOUT THE ORIGIN

*(SAME AS  $270^\circ$  CLOCKWISE)*

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

**Change the sign of  $y$ , then Swap.**

ROTATE  $90^\circ$  COUNTERCLOCKWISE ABOUT THE ORIGIN

Change the Sign of  $y$  and Swap

$$X(12, -3) \longrightarrow X'(3, 12)$$

$$Y(20, 14) \longrightarrow Y'(-14, 20)$$

# ROTATE $180^\circ$ COUNTERCLOCKWISE ABOUT THE ORIGIN

*(SAME AS  $180^\circ$  CLOCKWISE)*

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

**Change the SIGNS of BOTH X AND Y.**

ROTATE  $180^\circ$  COUNTERCLOCKWISE ABOUT THE ORIGIN

*Change Both Signs*

$$X(12, -3) \longrightarrow X'(-12, 3)$$

$$Y(20, 14) \longrightarrow Y'(-20, -14)$$

# ROTATE $270^\circ$ COUNTERCLOCKWISE ABOUT THE ORIGIN

*(SAME AS  $90^\circ$  CLOCKWISE)*

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

**Change the Sign of  $x$ , then Swap.**



ROTATE  $270^\circ$  COUNTERCLOCKWISE ABOUT THE ORIGIN

Change the Sign of  $x$  and Swap

$$X(12, -3) \longrightarrow X'(-3, -12)$$

$$Y(20, 14) \longrightarrow Y'(14, -20)$$

# HOMework

COMPLETE THE ROTATIONS  
HOMework

***\*UNIT 1 TEST ON THURSDAY\****

