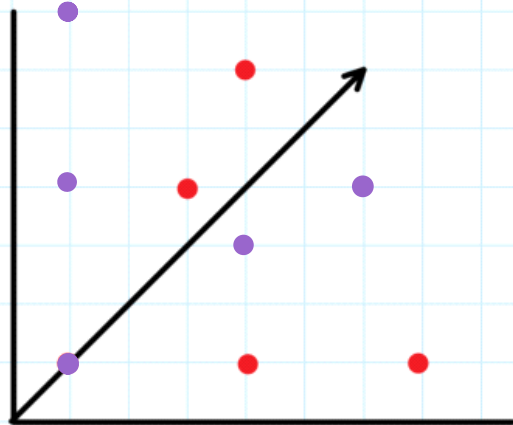


## 3.1 Reflections

Monday, September 23, 2019 7:46 AM

### WARM UP

Move the points from one side of the given line to the other, making sure that the point is the same distance from the line it was originally.



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## ESSENTIAL QUESTION

How are the properties of reflection used to transform a figure?

**NEEDED VOCAB:**

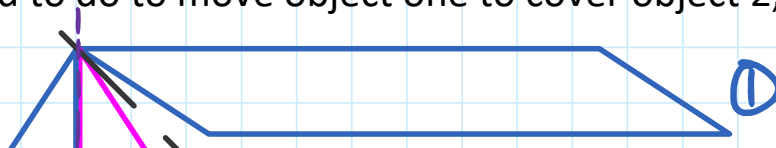
► **Rigid Motion**

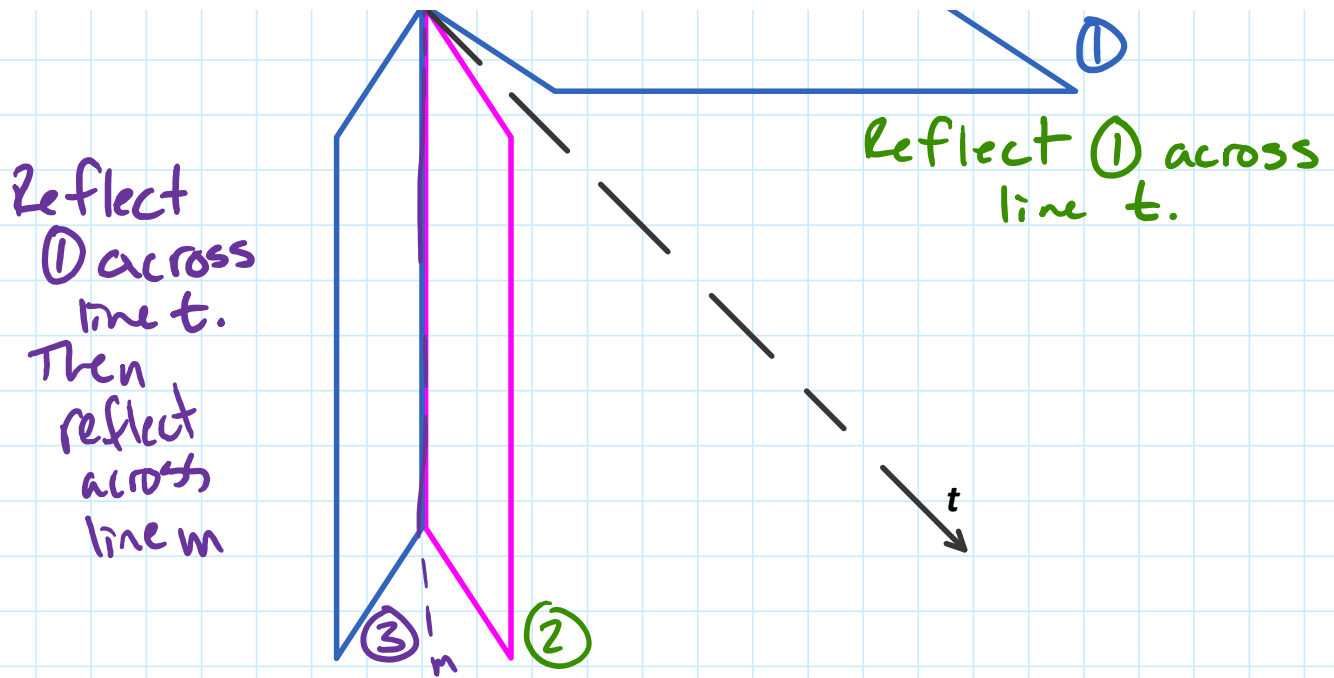
**GOAL: "I CAN. . .**

**Draw and describe the reflection of a figure across a line of reflection."**

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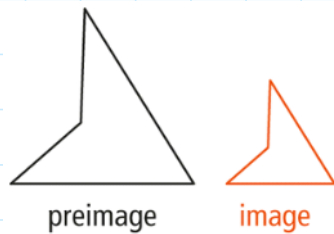
What would you need to do to move object one to cover object 2, object 3?





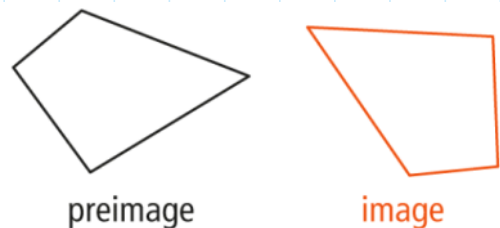
### EXAMPLE 1 Identify Rigid Motions

A **rigid motion** is a type of transformation that does not change the size or dimensions of the object. Is the transformation shown a rigid motion?



1. a. Is the transformation a rigid motion? Explain.

yes, looks like a rotation.



b. Is the transformation a rigid motion? Explain.

no, objects  
are 2 different  
sizes



preimage



image

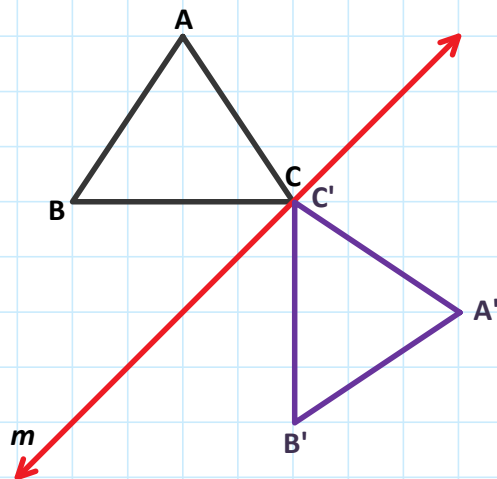
REFLECTIONS

A reflection is a transformation that reflects each point in a preimage across a line of reflection.

A reflection has these properties:

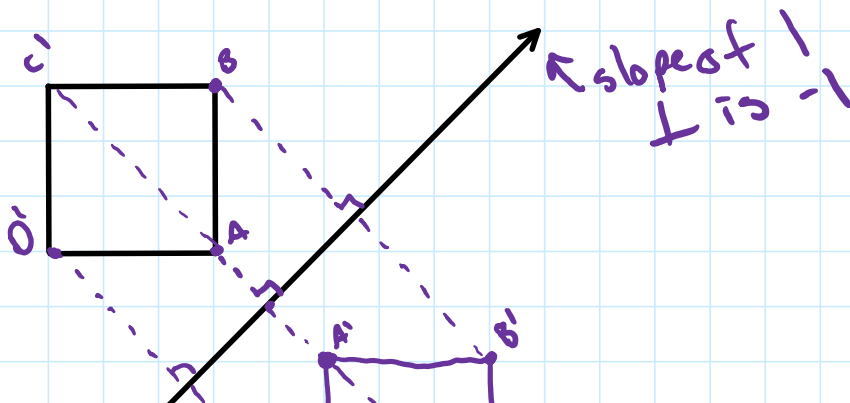
- If a point A is on line  $m$ , then the point and its image are the same point. ( $A'=A$ )
- If a point B is not on line  $m$ , line  $m$  is the perpendicular bisector of  $\overline{BB'}$

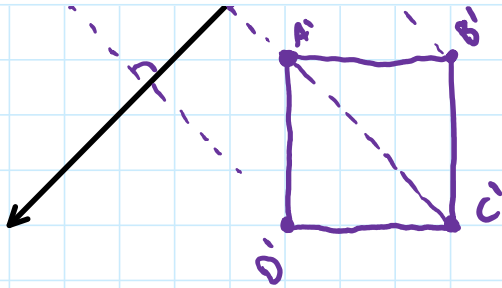
Reflections are rigid motions, so all dimensions and relationships are preserved.



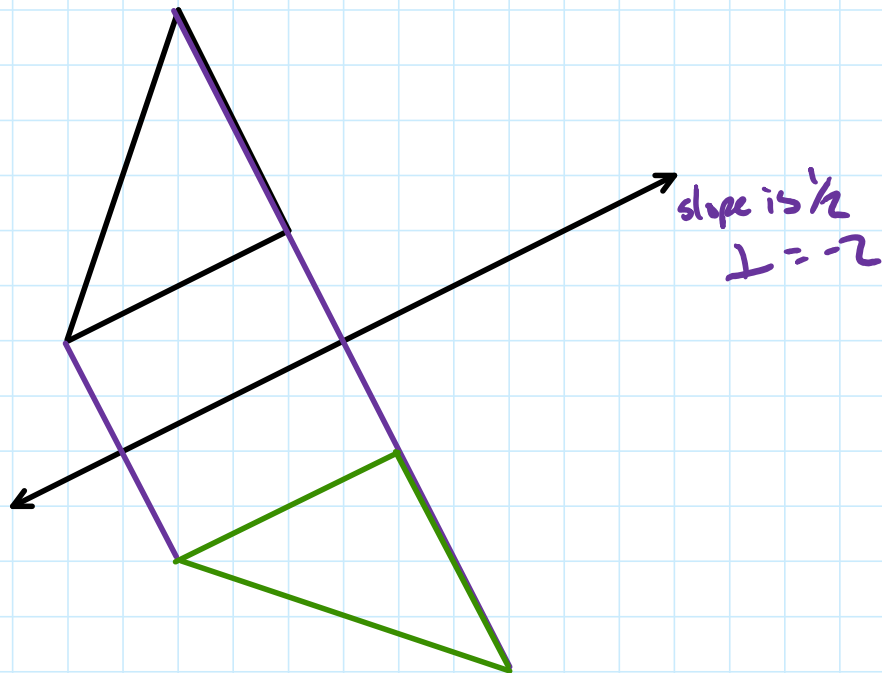
**EXAMPLE 2** Reflect a Figure Across a Line

What steps do you need to take to reflect the given preimage across the given line?

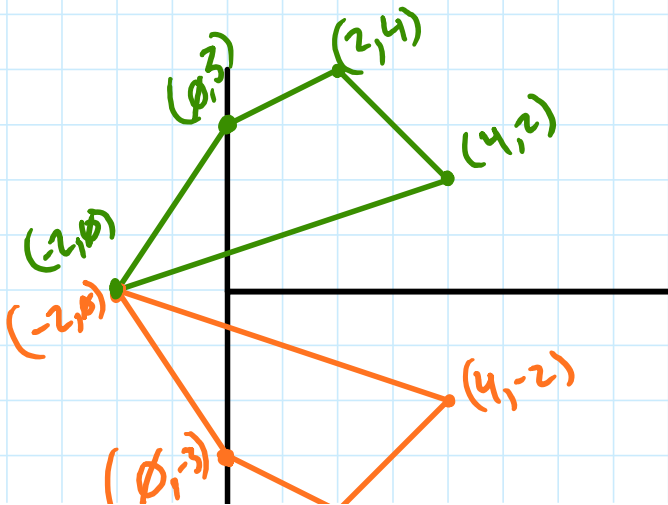




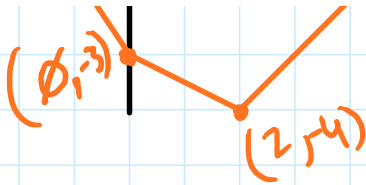
Reflect the given preimage across the given line.



**EXAMPLE 3** Quadrilateral  $FGHJ$  has coordinate  $F(0, 3)$ ,  $G(2, 4)$ ,  $H(4, 2)$ ,  $J(-2, 0)$ .  
 A. Graph and label  $FGHJ$  and then reflect it across the  $x$ -axis. What do you notice about the points of the preimage compared to the reflected points in the image?

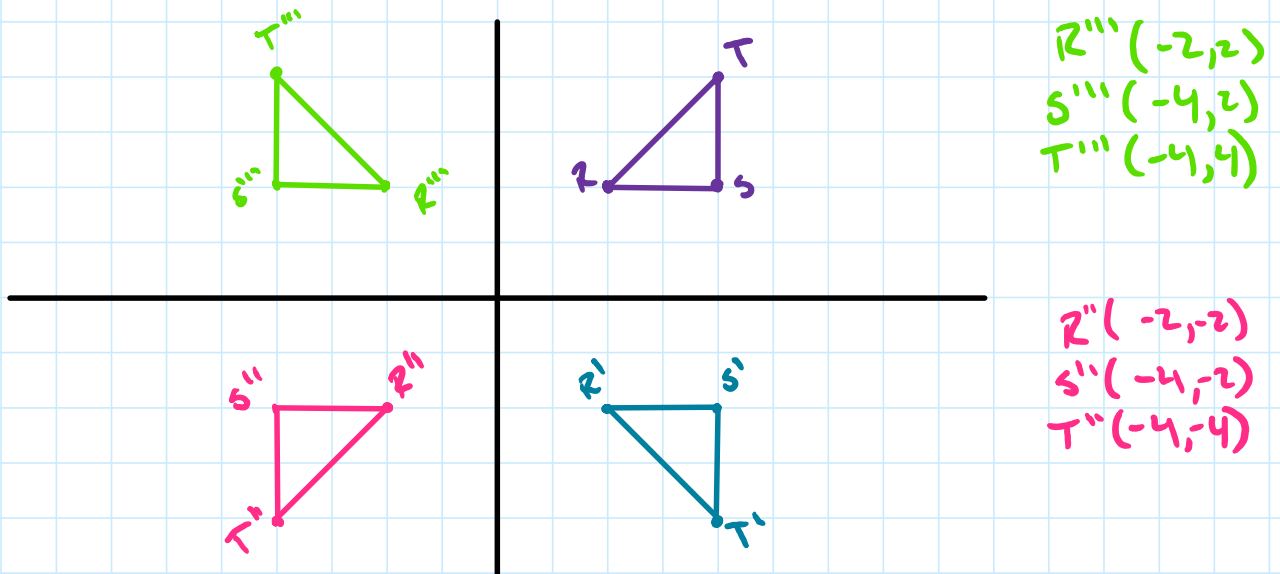


same #'s just  $y$  is opp. sign.  
 $\therefore$  when reflected across  $x$ -axis coordinate goes by  $(x, -y)$



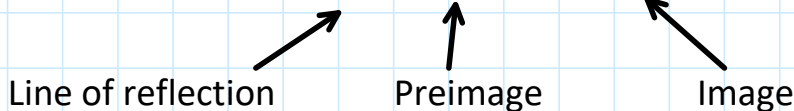
goes by - - -

Triangle RST has the coordinates R(2, 2), S(4, 2), T(4, 4). Reflect Triangle RST in the x-axis, image 1, as well as in the y-axis, image 2. Reflect image 1 in the y-axis and reflect image 2 in the x-axis. What are the coordinates of the final two images?



### EXAMPLE 4 Reflection Rules

Reflection Rules are in the form  $R_{x-axis}(\Delta RST) = (\Delta R'S'T')$



Find the Reflection Rule that maps  $\Delta KLM$  to its image.

K(1, 2), L(3, 4), M(2, 6)

K'(2, 1), L'(4, 3), M'(6, 2)

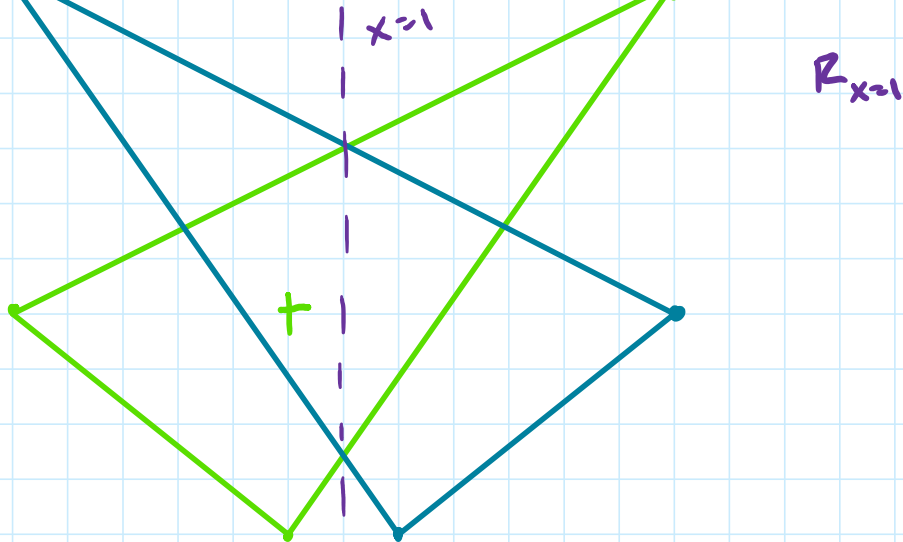
$R_{y=x}$

4. What is a reflection rule that maps each triangle to its image?

a.  $C(3, 8)$ ,  $D(5, 12)$ ,  $E(4, 6)$  and  
 $C'(-8, -3)$ ,  $D'(-12, -5)$ ,  $E'(-6, -4)$

$R_{y=-x}$

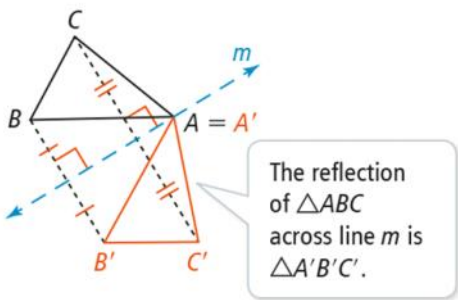
b.  $F(7, 6)$ ,  $G(0, -4)$ ,  $H(-5, 0)$  and  $F'(-5, 6)$ ,  $G'(2, -4)$ ,  $H'(7, 0)$



## Reflections

**WORDS** A reflection is a transformation that reflects each point in the preimage across a line of reflection.

### DIAGRAM



### SYMBOLS

$$R_m(\triangle ABC) = \triangle A'B'C'$$

$$R_m(A) = A'$$

Line  $m$  is the perpendicular bisector of  $\overline{BB'}$  and  $\overline{CC'}$ .

# HOMework

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**11, 16-18, 25, 27**

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