Created by Mr. Lischwe

Warmup 1/(Michael Jordan's Number)

1. How many degrees is a three-quarter turn? (Three-quarters of a full revolution)

2. When reflecting a figure across a line of reflection, is it ever possible for a point to be reflected onto **itself**? Explain using diagrams.

PLEASE GET:
- **Ruler**
- **Protractor**
- **One sheet of Patty Paper**

p. 851 (1-16) will be graded tomorrow

- (Yes, I am adding 13-16 now)

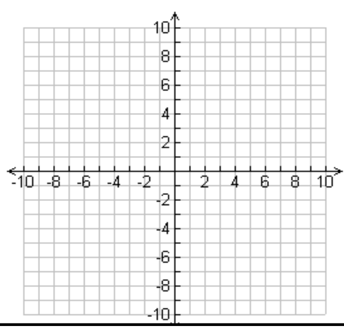
Back to your notes sheet from Friday…

Special types of reflections…

- These reflections are very common:
  - Reflect across the x-axis
  - Reflect across the y-axis
  - Reflect across the line y = x
  - Reflect across the line y = -x

- Let's look at each one a little more closely.

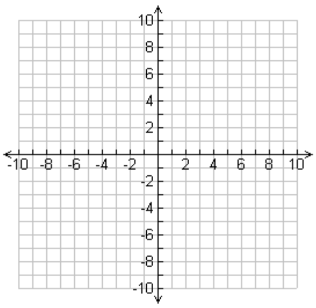
Reflecting across the line y = x



Reflecting across the line y = x

- When you reflect across the line y = x, you are performing this transformation:
  - **(x, y) → (y, x)**

Reflecting across the line y = -x



Reflecting across the line y = -x

- When you reflect across the line y = -x, you are performing this transformation:
  - **(x, y) → (-y, -x)**

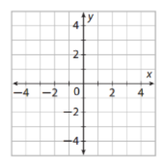
Chart on pg. 846

Rules for Reflections on a Coordinate Plane	
Reflection across the x-axis	$(x, y) \to (x, -y)$
Reflection across the y-axis	$(x, y) \to (-x, y)$
Reflection across the line $y = x$	$(x, y) \to (y, x)$
Reflection across the line $y = -x$	$(x, y) \to (-y, -x)$

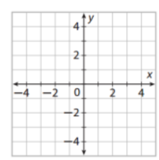
*****THESE SHOULD NOT BE THE MAIN WAY YOU DO REFLECTIONS. YOU WILL BE MUCH MORE SUCCESSFUL IF YOU UNDERSTAND THEM <u>VISUALLY</u> FIRST AND FOREMOST*****

Now try:

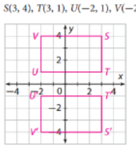
$S(3, 4)$, $T(3, 1)$, $U(-2, 1)$, $V(-2, 4)$; x-axis



$A(-4, -2)$, $B(-1, -1)$, $C(-1, -4)$; $y = -x$



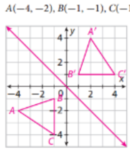
$S(3, 4)$, $T(3, 1)$, $U(-2, 1)$, $V(-2, 4)$; x-axis



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

$S'(3, -4)$, $T'(3, -1)$, $U'(-2, -1)$, $V'(-2, -4)$

$A(-4, -2)$, $B(-1, -1)$, $C(-1, -4)$; $y = -x$

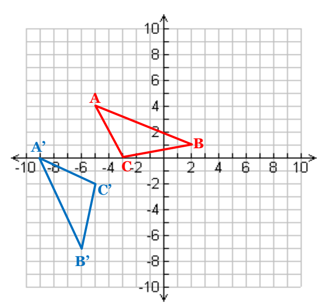


$(x, y) \to (-y, -x)$

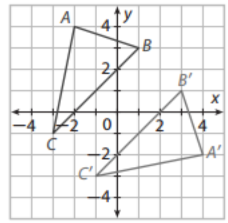
$A'(2, 4)$, $B'(1, 1)$, $C'(4, 1)$

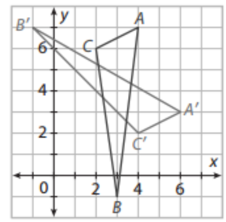
Finding the line of reflection

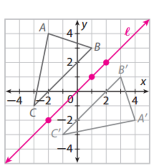
Who thinks they can draw it???



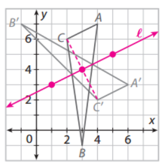
- To find the line of reflection, find the midpoint of each connecting line. Then connect these midpoints.
- You can always use the midpoint formula to find the midpoints (like in p. 847 Example A), but a lot of times you will be able to find the midpoint by counting squares.



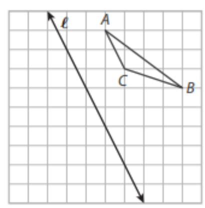


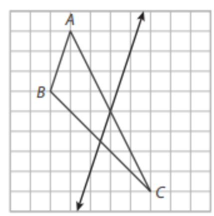


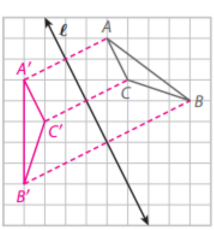
midpoints: $\overline{AA'}$: $\left(\frac{-2+4}{2}, \frac{4+(-2)}{2}\right) = (1, 1)$;
$\overline{BB'}$: $\left(\frac{1+3}{2}, \frac{3+1}{2}\right) = (2, 2)$;
$\overline{CC'}$: $\left(\frac{-3+(-1)}{2}, \frac{-1+(-3)}{2}\right) = (-2, -2)$

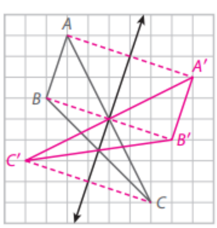


midpoints: $\overline{AA'}$: $\left(\frac{4+6}{2}, \frac{7+3}{2}\right) = (5, 5)$;
$\overline{BB'}$: $\left(\frac{3+(-1)}{2}, \frac{-1+7}{2}\right) = (1, 3)$;
$\overline{CC'}$: $\left(\frac{2+4}{2}, \frac{6+2}{2}\right) = (3, 4)$







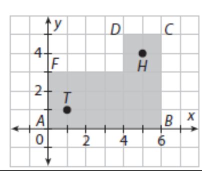


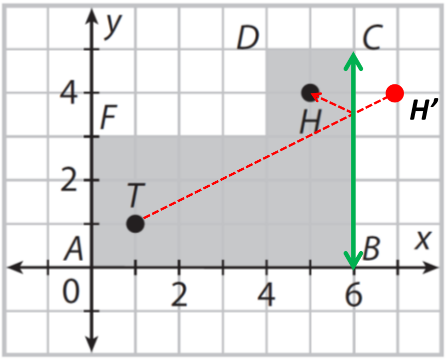
Real-World Application That Will Allow You To Be Really Good At Mini-Golf Or Pool Or Anything Else Where You Have To Bounce A Ball Off A Wall

Explain 4 Applying Reflections

Example 4

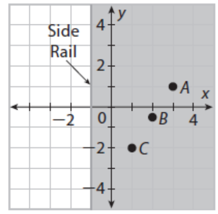
The figure shows one hole of a miniature golf course. It is not possible to hit the ball in a straight line from the tee T to the hole H. At what point should a player aim in order to make a hole in one?





YOU TRY: p.850 (15)

15. Cara is playing pool. She wants to use the cue ball *C* to hit the ball at point *A* without hitting the ball at point *B*. To do so, she has to bounce the cue ball off the side rail and into the ball at point *A*. Find the coordinates of the exact point along the side rail that Cara should aim for.



Reflect point *C* across the side rail to locate *C′*. The coordinates of *C′* are $(-3, -2)$. Locate point *X* where $\overline{AC'}$ intersects the side rail. The coordinates of point *X* are $(-1, -1)$. Cara should aim for the point $(-1, -1)$ along the side rail.

Table of Contents (2nd Semester)

Rotations

3

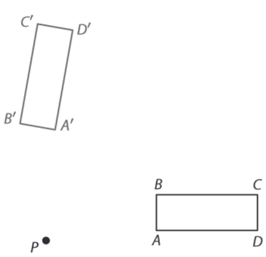
Objective:

-Perform rotations on shapes using a protractor

-Rotate figures 90°, 180°, and 270° on a coordinate plane

Finding the angle of rotation

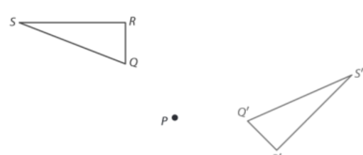
- Estimate: by what angle do you think rectangle ABCD was rotated?
- Was it rotated clockwise or counterclockwise?



80°

Finding the angle of rotation

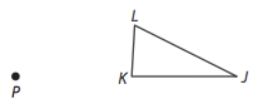
- Estimate: By what angle do you think the shape was rotated?
- Which direction was it rotated?



135°

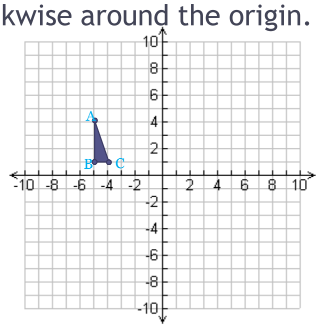
Now you try to draw one!

Counterclockwise rotation of 40° around point *P*



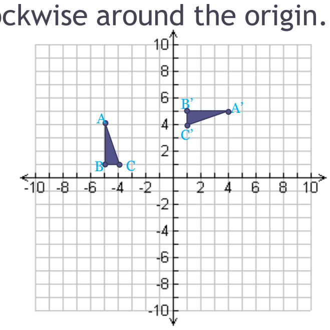
What about rotations in the coordinate plane?

Challenge: ROTATE the shape 90º clockwise around the origin.



Coordinates:
A (-5, 4)
B (-5, 1)
C (-4, 1)

Challenge: ROTATE the shape 90º clockwise around the origin.



Coordinates:
A (-5, 4)
B (-5, 1)
C (-4, 1)

Rotations Video (2 min)

- https://www.youtube.com/watch?v=1sxmI4Y1K3s

Homework

- p. 851 (1-16) +Reflections Review WS