Name: _____ Date: _____ Period: _____ Score: _____

(handwritten: notes)

Isometric Transformations: Rotations

Rotation: A transformation that turns the plane through a given angle about (around) a given point.

In other words, a translation is a turn around a center point. The angle is called the <u>angle of rotation</u> and the point around which the plane is turned is called the <u>center point of rotation</u>.

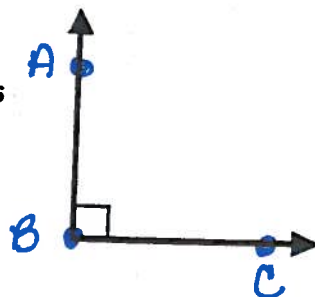But before we start spinning around, lets talk about angles and clocks.

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1. What kind of angle is this?

Right

How many degrees does it measure? *90°*

$\overline{AB} \perp \overline{BC}$

(diagram with points A, B, C forming a right angle)

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2. *(diagram of a straight angle on a line)*

What kind of angle is this? *Straight*

How many degrees does it measure?

180°

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3. How many degrees are there in a quarter rotation clockwise?

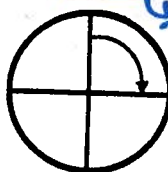$\frac{360}{4} = 90°$ $\frac{1}{4}$ of 360

Did this rotate the same direction as a clock or against it? *Same*

So a rotation ~~counter~~-clockwise means rotate _____ *with* _____ a clock.
We can also say this is a -90° rotation. *(−)*

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4. How many degrees are there in a half rotation clockwise?
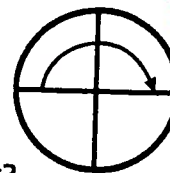
$\frac{360}{2} = 180°$ $\frac{1}{2}$ of 360

Did this rotate the same direction as a clock or against it? *same*

So a rotation ~~counter~~-clockwise means rotate _____ *with* _____ a clock.
We can also say this is a -180° rotation. *(−)*

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5. How many degrees are there in a quarter rotation counter-clockwise?
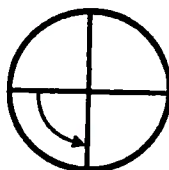
90°

Did this rotate the same direction as a clock or against it? *against it*

So a rotation counter-clockwise means rotate _____ *against* _____ a clock.
We can also say this is a 90° rotation. *(+)*

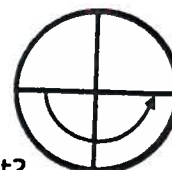**6. How many degrees are there in a half rotation counter-clockwise?**

180°

Did this rotate the same direction as a clock or against it? *against*
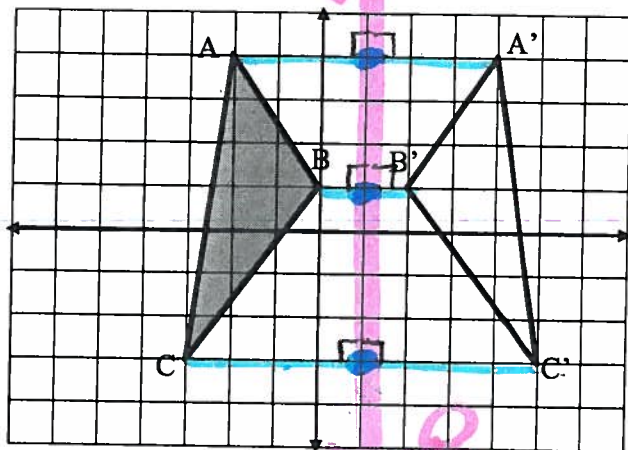
So a rotation counter-clockwise means rotate _____ *against* _____ a clock.
We can also say this is a 180° rotation. *(+)*

1

Directions: Answer each question.

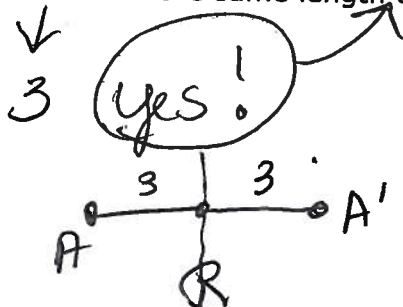**7a.** Draw the line of reflection that maps ABC to its image A'B'C'. Label the line *R*.

b. Draw arrows from each point in ABC to that points image.

c. What is |AA'|, |BB'| and |CC'|

|AA'| = ___6___ |BB'| = ___2___

|CC'| = ___8___

d. What is the length along $\overline{AA'}$ to the line of reflection? Is it the same length on both sides?

3   (yes!)

3   3   A'
A   R

e. Repeat question d for $\overline{BB'}$ and $\overline{CC}$.   R = line of reflection

B to B' = 2 (yes)   B to R = 1
                      B' to R = 1

C to C' = 8 (yes)   C to R = 4
                      C' to R = 4

f. This means that the line of reflection _**bisects**_ AA', BB' and CC'.

g. What appears to be the angle where $\overline{AA}$, $\overline{BB}$, and $\overline{CC}$ intersect line *R*.

Line R is perpendicular to the horizontal lines (Forms Right ∠s)

This means that the line of reflection is the **Perpendicular Bisector** of $\overline{AA}$, $\overline{BB}$ and $\overline{CC}$.

Hilda says that this is true of any line of reflection. Quinn says that it isn't always true. Which one do you think is correct. Explain your answer.

A   A'

Hilda ||||
Quinn |

Per 2 (needs)