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Date: _____

CC GEOMETRY

TROICI

MINI-LESSON #9: TRANSFORMATIONS

TOPIC 1: TYPES OF TRANSFORMATION

same size, orientation preserved, CCW or CW

	KEY WORD	RIGID MOTION?	DIRECT/OPOSITE ISOMETRY	IMAGE
REFLECTION	FLIP	yes	OPPOSITE	
ROTATION	TURN	yes	Direct	
TRANSLATION	SLIDE	yes	Direct	
DILATION	GROW/SHRINK	NO	Direct	

RULES FOR ROTATIONS AND REFLECTIONS:

TYPE OF ROTATION	Point of the pre-image (Before reflection)	Point of the image (After reflection)
Rotation of 90° (clock wise)	(x, y)	(y, -x)
Rotation of 90° (counter clock wise)	(x, y)	(-y, x)
Rotation of 180° (clock wise & counter clock wise)	(x, y)	(-x, -y)
Rotation of 270° (clock wise)	(x, y)	(-y, x)
Rotation of 270° (counter clock wise)	(x, y)	(y, -x)

TYPE OF REFLECTION	Point of the pre-image (Before reflection)	Point of the image (After reflection)
Reflection about the x-axis	(x, y)	(x, -y)
Reflection about the y-axis	(x, y)	(-x, y)
Reflection about the line y = x	(x, y)	(y, x)
Reflection about the line y = -x	(x, y)	(-y, -x)
Reflection about the origin	(x, y)	(-x, -y)

TOPIC 2: LINE DILATIONS

How to Dilate a Line $\rightarrow \times 3$

Line $y = 2x + 2$ is transformed by a dilation with a scale factor of 3 and centered at the origin. What is the equation of the line after the dilation?

Step 1) Draw the given Line

Step 2) Dilate ANY point on the line from the center of dilation

Point
 $(0, 2) \rightarrow (0, 6)$
 $\times 3$

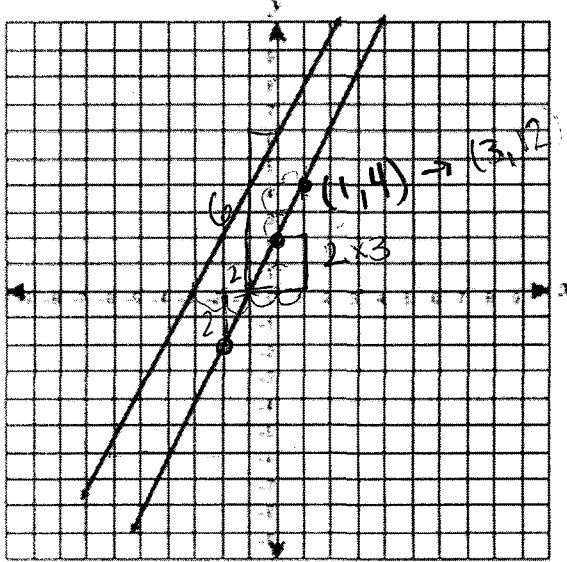
Step 3) Write the equation of the new line

$m = 2$
 $x = 0$
 $y = 6$

$y = mx + b$
 $(6) = (2)(0) + b$
 $6 = b$
 $y = 2x + 6$

Solve for m

Lines are $\parallel \rightarrow$ same slope!



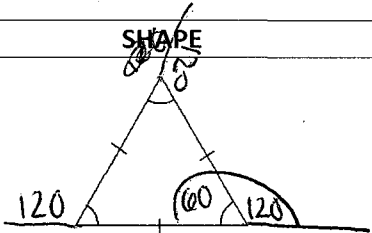
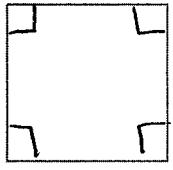
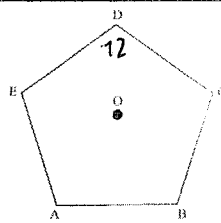
TOPIC 3: MAPPING A REGULAR POLYGON ONTO ITSELF

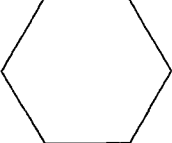
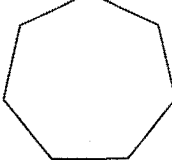
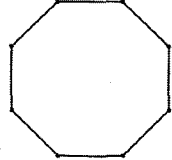
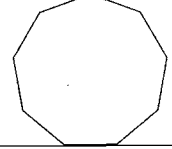
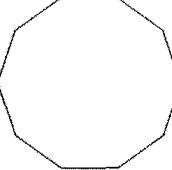
Definition: Regular Polygon

A polygon where all side/angles are \cong

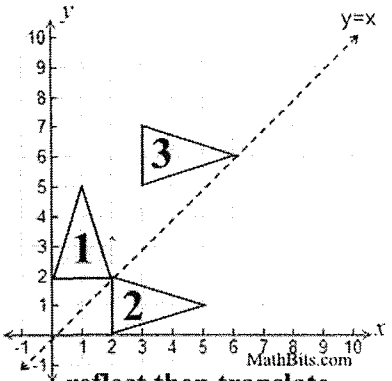
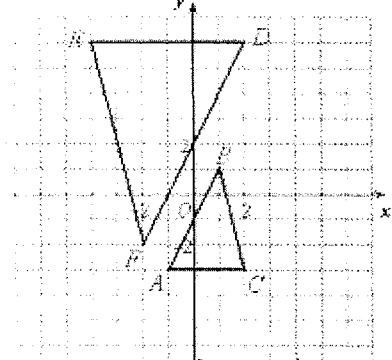
When a polygon is rotated onto itself, it rotated by a multiple of the exterior angles in a polygon.

mapping polygon onto itself

SHAPE	NUMBER OF SIDES	DEGREES OF EXTERIOR ANGLE
	3	$\frac{360}{3} = 120$
	4	$\frac{360}{4} = 90$
	5	$\frac{360}{5} = 72$

	6	$\frac{360}{6} = 60$
	7	$\frac{360}{7} = 51.4$
	8	$\frac{360}{8} = 45$
	9	$\frac{360}{9} = 40$
	10	$\frac{360}{10} = 36$

TOPIC 4: COMPOSITION OF TRANSFORMATIONS

COMPOSITOIN OF RIGID MOTIONS	SIMILARITY TRANSFORMATION
<p>When a pre-image follows a sequence of rotations, reflections and/or translations</p>	<p>When a pre-image follows a sequence of rigid motions <u>AND</u> dilations</p>
 <p>reflect then translate</p>	 <p>rotate and dilate</p>

