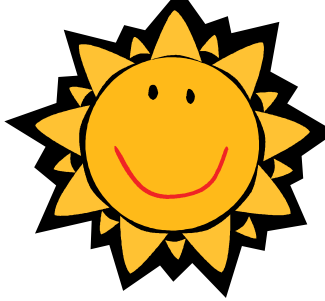
Unit 1 Day 4

DILATIONS

Warm Up



Given the line segment with points A(-1, 4) and B(2, 5) graph the image after the following transformations, identify the coordinates of the image, and write the Algebraic Rule for #1 & 2.

1) Reflect over the line y = x.

A'(4, –1), B'(5, 2)

(x, y) → (y, x)

2) Reflect over the line y = -x.

A'(–4, 1), B'(–5, –2)

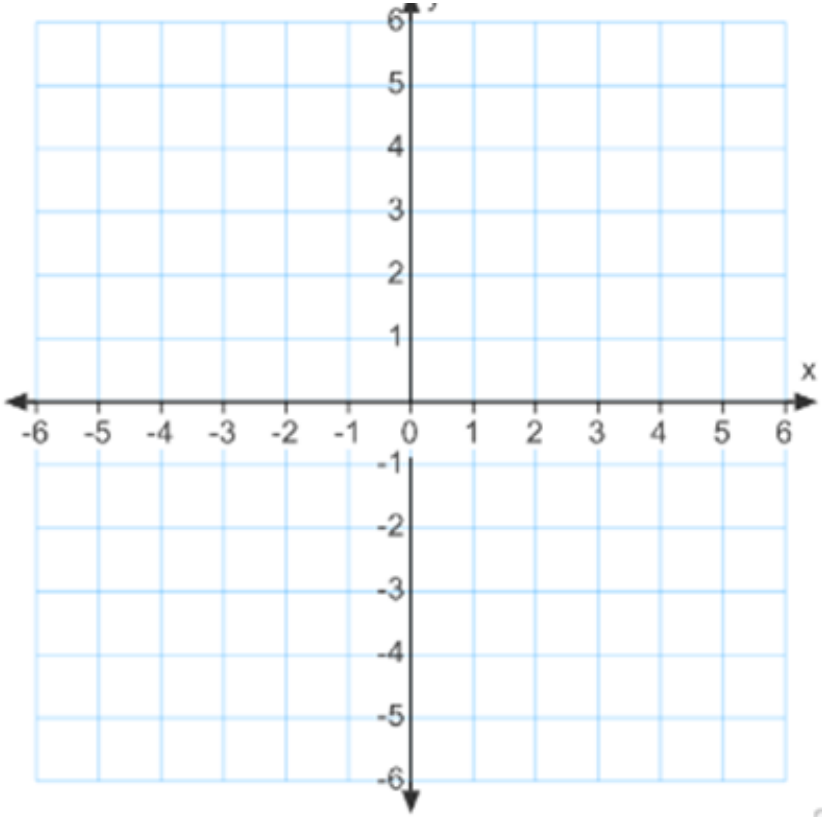
(x, y) → (–y, –x)

3) Reflect over the line y = 3.

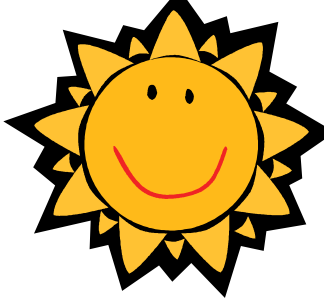
A'(–1, 2), B'(2, 1)

4) Reflect over the line x = -1.

A'(–1, 4), B'(–4, 5)



Warm Up



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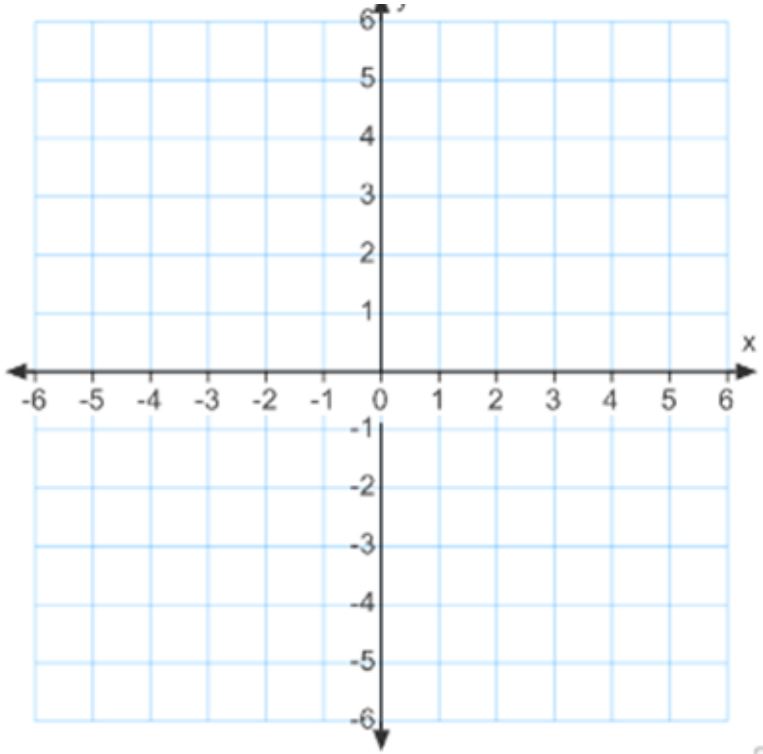
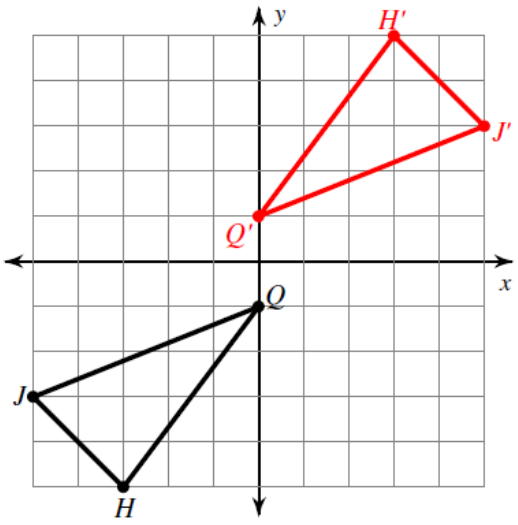


Done Early? Do Day 3 Notes Supplement Worksheet - Rotations of Polygons

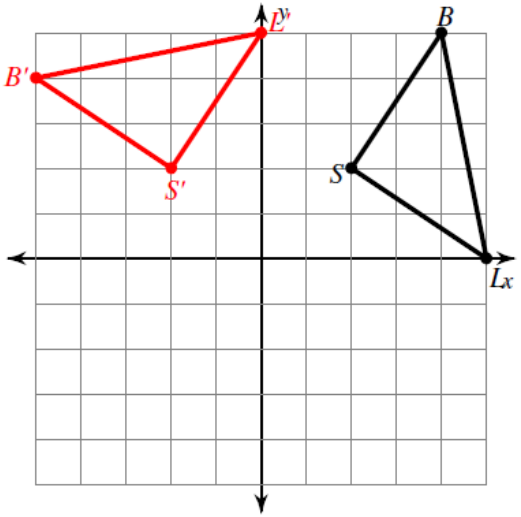
Day 3 Homework Answers

1) rotation 180° about the origin



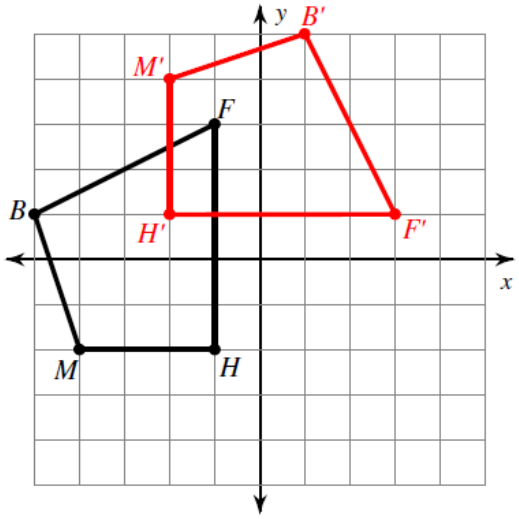
H'(3, 5)
J'(5, 3)
Q'(0, 1)
(x, y) → (–x, –y)

2) rotation 90° counterclockwise about the origin



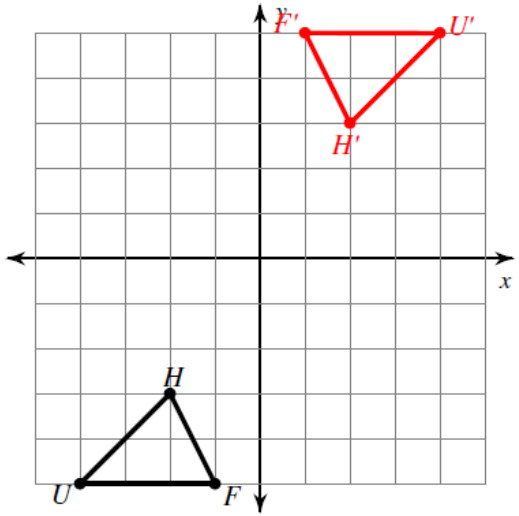
B'(–5, 4)
L'(0, 5)
S'(–2, 2)
(x, y) → (–y, x)

3) rotation 90° clockwise about the origin



B'(1, 5)
F'(3, 1)
H'(–2, 1)
M'(–2, 4)
(x, y) → (y, –x)

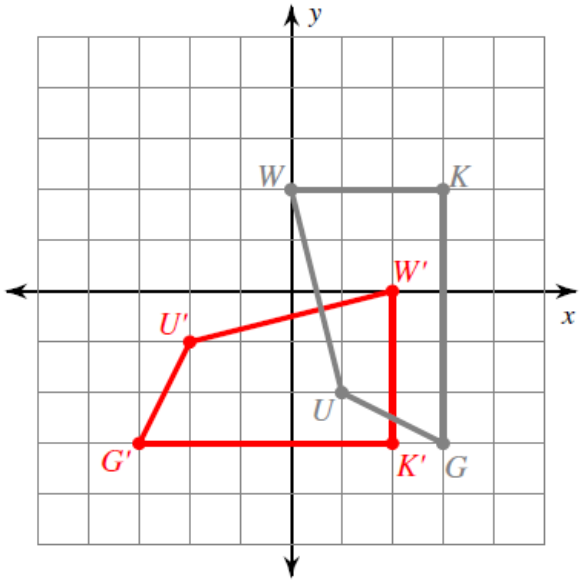
4) rotation 180° about the origin



F'(1, 5)
H'(2, 3)
U'(4, 5)
(x, y) → (–x, –y)

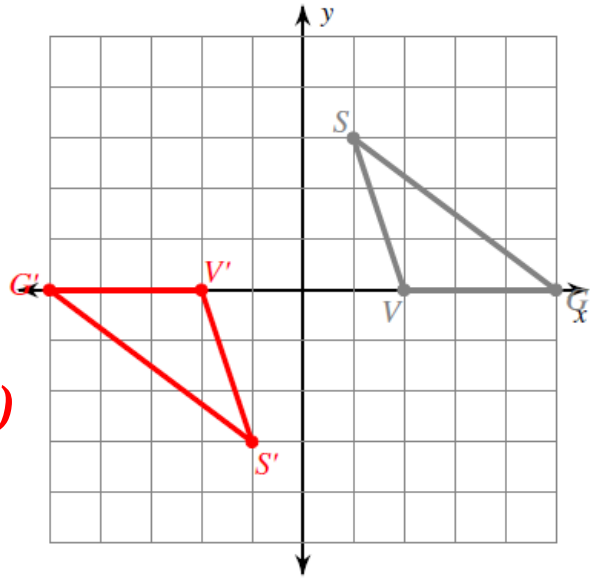
Day 3 Homework Answers

5) rotation 90° clockwise about the origin
$U(1, -2)$, $W(0, 2)$, $K(3, 2)$, $G(3, -3)$



U'(–2, –1)
W'(2, 0)
K'(2, –3)
G'(–3, –3)
(x, y) → (y, –x)

6) rotation 180° about the origin
$V(2, 0)$, $S(1, 3)$, $G(5, 0)$



V'(–2, 0)
S'(–1, –3)
G'(–5, 0)
(x, y) → (–x, –y)

7) rotation 180° about the origin
$Z(-1, -5)$, $K(-1, 0)$, $C(1, 1)$, $N(3, -2)$
$Z'(1, 5)$, $K'(1, 0)$, $C'(-1, -1)$, $N'(-3, 2)$
(x, y) → (–x, –y) $R_{0,180}$

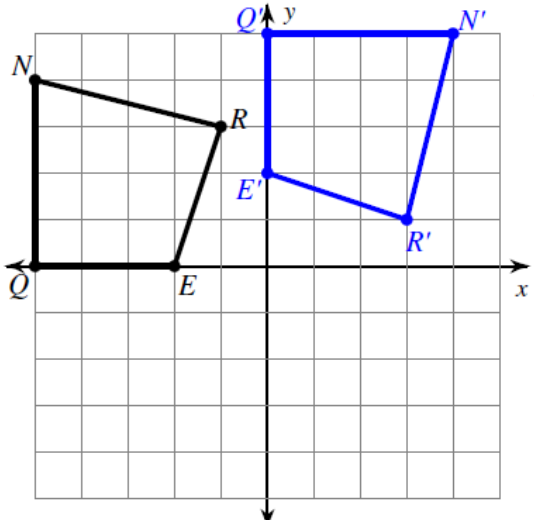
8) rotation 180° about the origin
$L(1, 3)$, $Z(5, 5)$, $F(4, 2)$
$L'(-1, -3)$, $Z'(-5, -5)$, $F'(-4, -2)$
(x, y) → (–x, –y) $R_{0,180}$

9) rotation 90° clockwise about the origin
$S(1, -4)$, $W(1, 0)$, $J(3, -4)$
$S'(-4, -1)$, $W'(0, -1)$, $J'(-4, -3)$
(x, y) → (y, –x) $R_{0,270}$

10) rotation 180° about the origin
$V(-5, -3)$, $A(-3, 1)$, $G(0, -3)$
$V'(5, 3)$, $A'(3, -1)$, $G'(0, 3)$
(x, y) → (–x, –y) $R_{0,180}$

Day 3 HW Answers

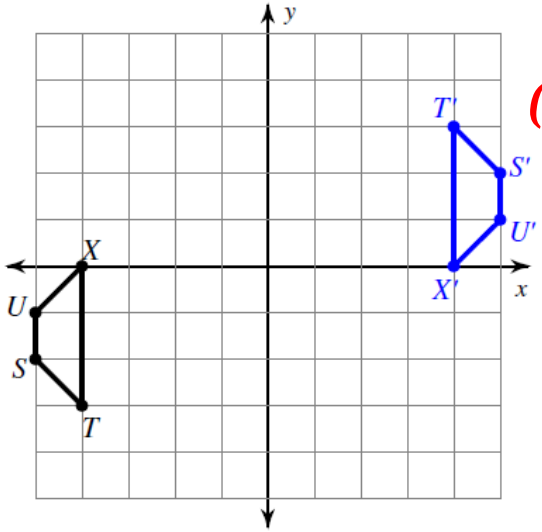
11)



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

rotation 90° clockwise about the origin

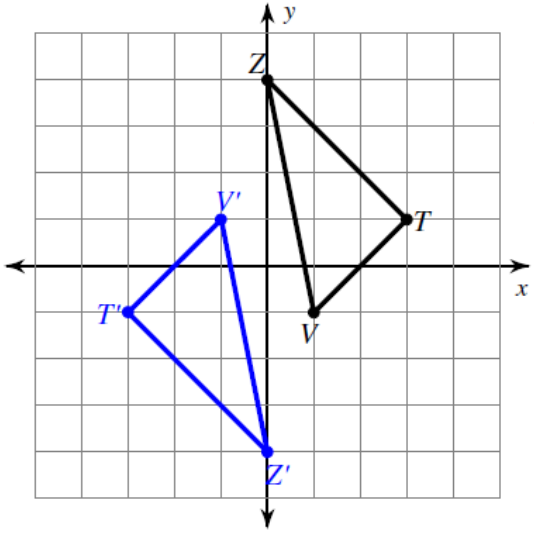
12)



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

rotation 180° about the origin

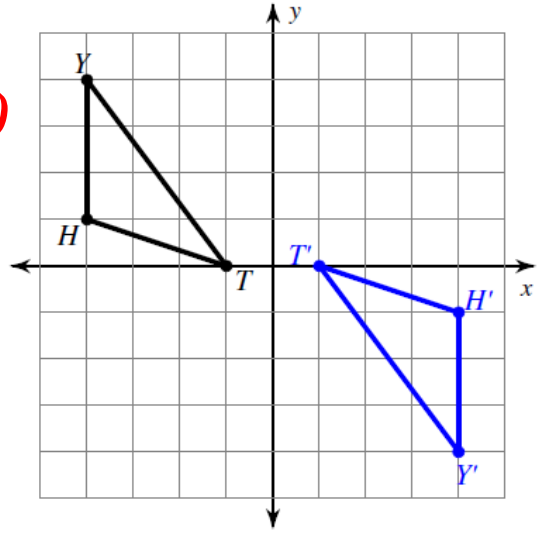
13)



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

rotation 180° about the origin

14)



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

rotation 180° about the origin

Day 3 Homework Answers
Packet p. 19-20 multiples of 3

3. (-16,-8)

6. (-4,-4)

9. (5,4)

12. (1,-4)

15. (6,2)

18. (3,2)

21. (2,0)

24. (-7,9)

27. (-8,-3)

30. (-5,8)

33. (-6,11)

Tonight's HW

- Packet p. 10
  Packet p. 13-14 evens, Packet p. 15
- Study for quiz tomorrow!!!
- Complete the Algebra Rules side of the Colored Study Guide & Check your answers on the website! ☺

****Print new HW Packet Days 5-7!**
You need them for class tomorrow & the p18-20 HW tonight!

Let's discuss the quiz ☺

- Graphing Transformations

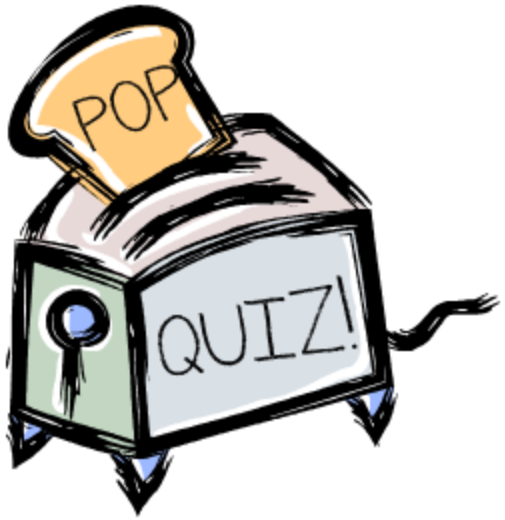
- Short Answer Questions
- Multiple choice questions

***It's like a short test!**

Pay attention to the time allowed for the quiz! That's all you get!

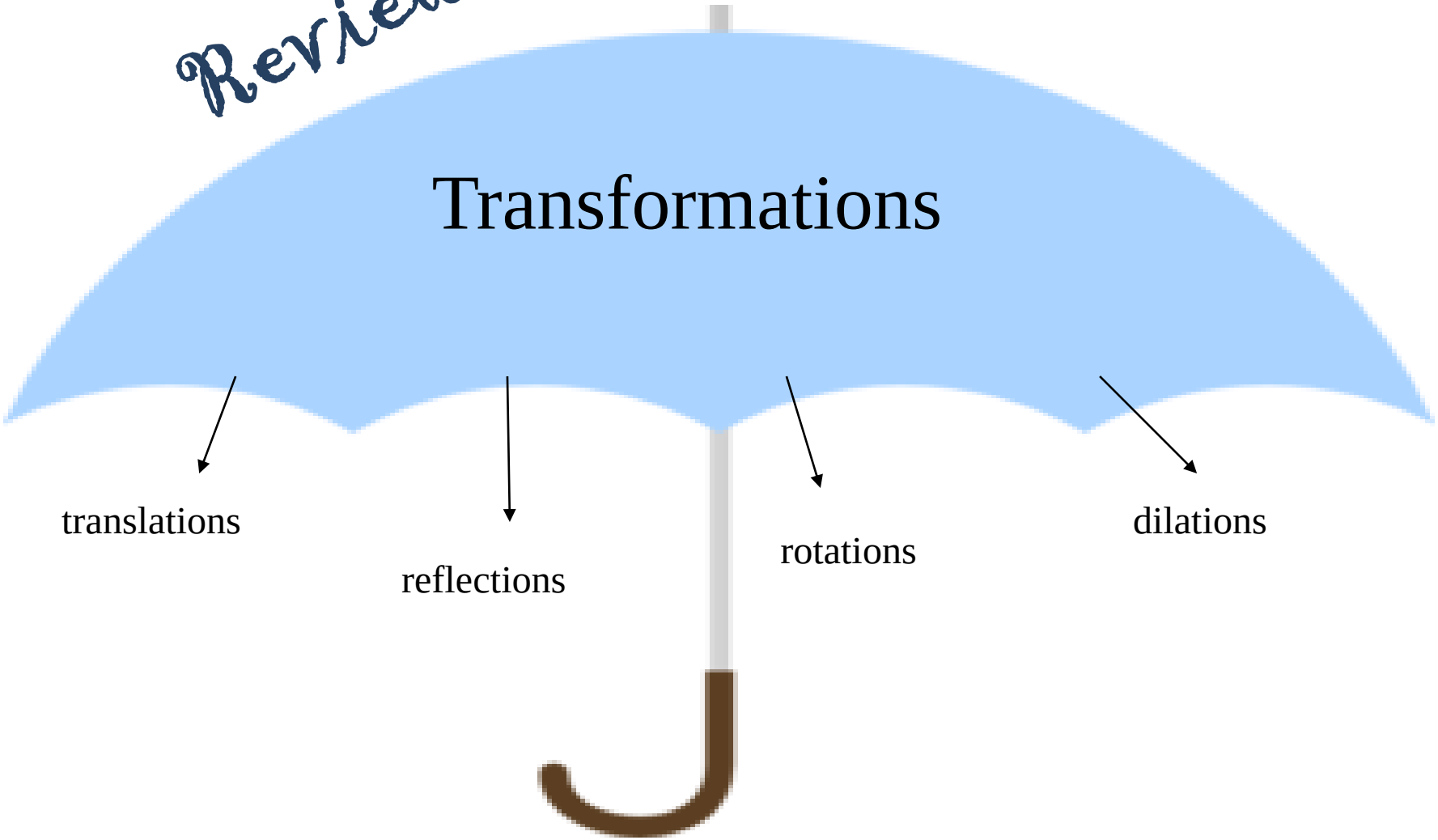
Practice Pop Quiz!

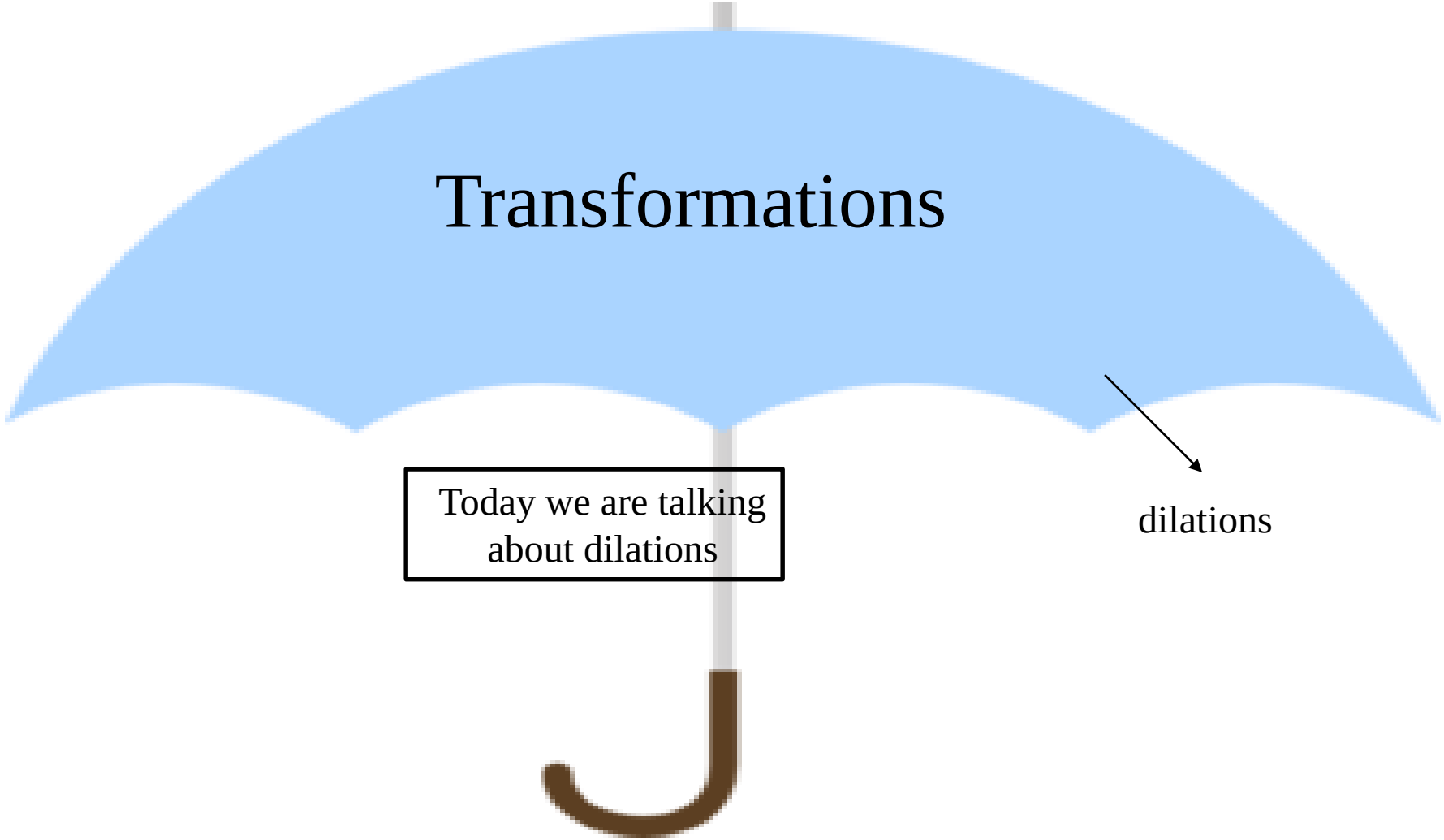
*Let's test your knowledge of the Algebra Rules ☺



Review

Transformations



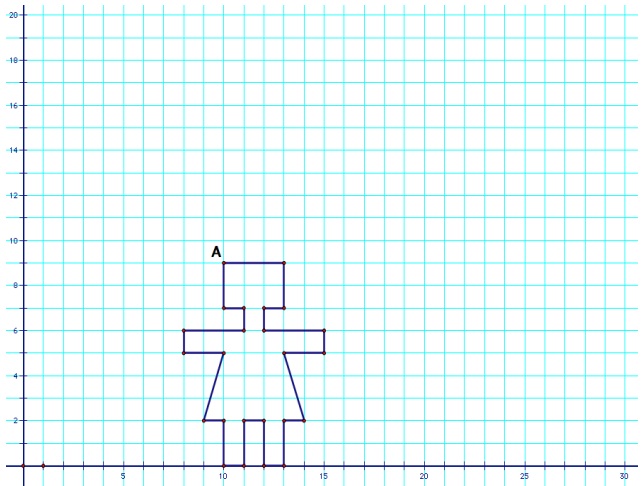

Transformations
Today we are talking about dilations
dilations

Please clear your desk of everything but: ruler, two colored pencils, notes packet and a calculator.

Complete the Dilations Discovery Activity

Notes p. 13 - 15

Alice in Wonderland



Alice in Wonderland ~ Part One

Starting Height	Alice Eat OR Drinks	Scale Factor from above	New Height
54 inches	Red Potion	$\frac{1}{9}$	6 inches
6 inches	Chocolate Cake	12	72 inches
72 inches	Yellow Potion	$\frac{1}{4}$	18 inches
18 inches	Carrot Cake	9	162 inches
162 inches	Blue Potion	$\frac{1}{36}$	4.5 inches
4.5 inches	Lemon Cake	10	45 inches
45 inches	Green Potion	$\frac{1}{15}$	3 inches
3 inches	Red Velvet Cake	18	54 inches

Summary:

A **dilation** is

- An enlargement of the pre-image if the **scale factor** is **greater than one (SF > 1)**.

- A reduction of the pre-image if the **scale factor** is **between zero and one (0 < SF < 1).**

- If the scale factor is 1, then the pre-image and image are **congruent**.

The **center** of dilation is a fixed point in the plane about which all points reference too.

A dilation is *SOMETIMES / ALWAYS / NEVER* an Isometry

Remember, from Day 1: An Isometry is a transformation in which the pre-image and image are congruent!

The amount by which the image grows or shrinks is called **scale factor**

Write these in your notes! ☺

Practice: Dilations with Coordinates

Notes p.16 & 17

Practice p. 16

2. Graph a new figure on the same coordinate plane by applying a scale factor of 2.

   What is the Algebraic Rule for this transformation? $(x, y) \rightarrow (2x, 2y)$
   How do the preimage and image compare? Describe the figure and the coordinate pairs.

   The image is twice the size. The x and y values double.

3. Graph a new figure on the same coordinate plane by applying a scale factor of 1/2.

   What is the Algebraic Rule for this transformation? $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$
   Compare the preimage to the dilated figure. Describe the figure and the coordinate pairs.

   The image is half the size. The x and y values are divided by 2.

4. What happens when you apply a scale factor greater than 1 to a set of coordinates?

   It is an enlargement. The figure gets bigger.

5. What happens when you apply a scale factor less than 1 to a set of coordinates?

   It is a reduction. The figure gets smaller.

6. What happens when you apply a scale factor of 1 to a set of coordinates?

The figure stays the same size. The image is congruent to the preimage.

Practice: Dilations with Coordinates p. 17 ANSWERS

1. Reduction with scale factor of ½
   (x, y) → (½x, ½y)
2. Enlargement with scale factor of 2
   (x, y) → (2x, 2y)
3. Enlargement with scale factor of 1.5
   (x, y) → (1.5x, 1.5y)

Summarize with Algebraic Rules:

What type of transformation does the following algebraic rule produce?

$(x, y) \rightarrow (ax, ay)$ if $a > 1$ then **enlargement**

if $0 < a < 1$ then **reduction**

where

a = scale factor

Transformation Rules Summary *Dilations

Enlargement : $(x, y) \rightarrow (ax, ay)$

$a > 1$

Reduction: $(x, y) \rightarrow (ax, ay)$

$0 < a < 1$

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