Name _____ #83

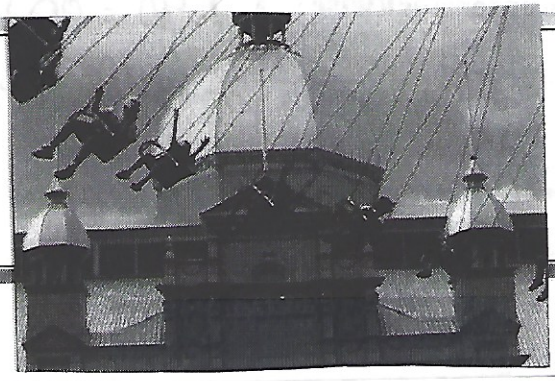
Lesson Page

An Intuitive Notion of Rotation

Math A

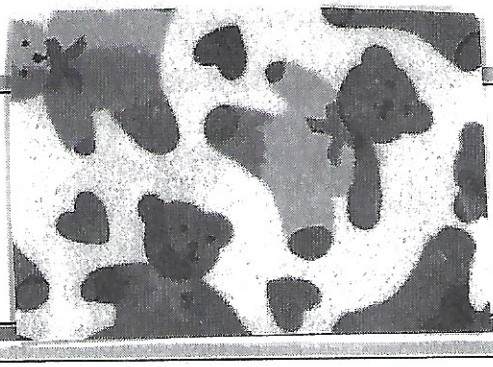
A rotation is a transformation that turns a figure about a fixed point called the center of rotation. An object and its rotation are the **same shape and size**, but the **figures may be turned in different directions.**

When you are riding on a ferris wheel, you are experiencing a rotation.



Amusement park swings allow you to experience a rotation.

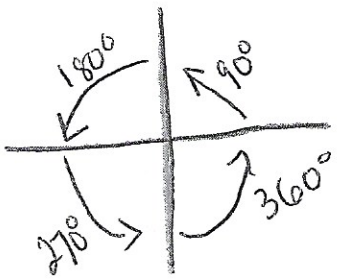
Rotations can be seen in planetary movement.



The concept of rotations can be seen in wallpaper designs and art work.

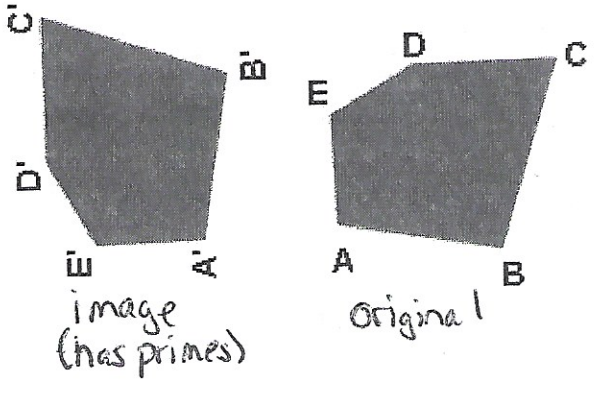
Rotations are TURNS!!!

In mathematics, the rotation of an object is called its **image**. If the original object was labeled with letters, such as polygon ABCDE, the image may be labeled with the same letters followed by a ***prime*** symbol, A'B'C'D'E'. Rotations can occur in either a **clockwise** or **counterclockwise** direction.



Clockwise	Counterclockwise
	

* 90° = on its side
* 180° = upside down



This rotation is 90° counterclockwise.

11/19/01

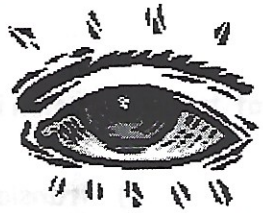
Lesson Page

An Intuitive Notion of Dilation

Math A

A **dilation** is a transformation that produces an image that is the **same shape** as the original, but is a **different size.**

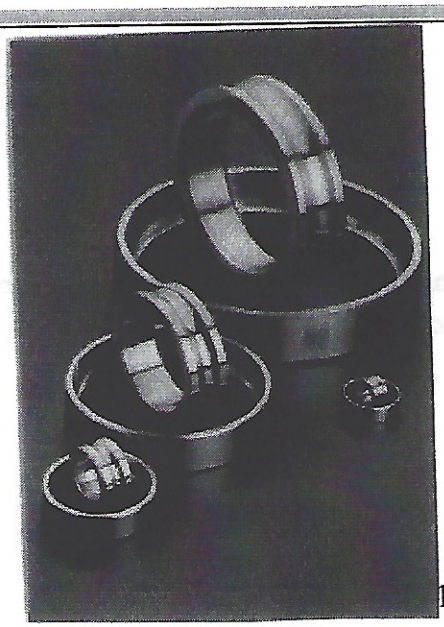
A dilation used to create an image **larger** than the original is called an **enlargement**. A dilation used to create an image **smaller** than the original is called a **reduction**.



You are probably familiar with the word "**dilate**" as it relates to the eye. ***"The pupils of the eye were dilated."*** As light hits the eye, the pupil enlarges or contracts depending upon the amount of light. This concept of enlarging and contracting is "dilating".

The washers shown in this photo illustrate the concept of dilation.

The washers are the same shape, but they are different in size.



Dilation

I. Scale factor: what you **multiply** by to enlarge or reduce a shape.

**If the scale factor is greater than 1 it is an enlargement
If the scale factor is less than 1 (but greater than 0) it is a reduction.

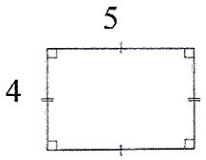
II Symbol: $D_{\#}$ The number that is in the number sign spot is the number that you multiply. For example: D_2 The scale factor would be 2 so you would multiply the dimensions or coordinates by 2

III. Examples:

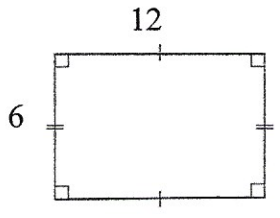
1) Find the image of (6,2) under the dilation D_4.

2) Find the image of (-4,-2) under the dilation D $\frac{1}{2}$

3) What would the new dimensions of the rectangle below be after a dilation of D_3



4) What would the new dimensions of the rectangle below be after a dilation of D $\frac{1}{3}$

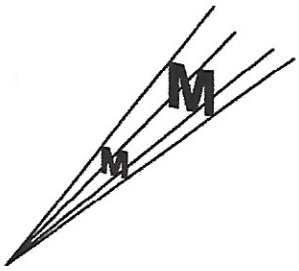


Name: _____ Date:_____

8R Period_____

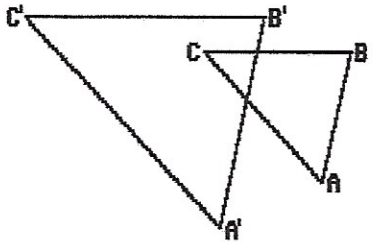
ROTATION / DILATION WORKSHEET

1) What type of transformation for letter M is shown in the accompanying diagram?



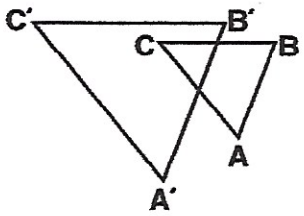
A) rotation
B) dilation
C) line reflection
D) translation

2) In the diagram below, $\triangle ABC$ is similar but *not* congruent to $\triangle A'B'C'$. Which transformation is represented by $\triangle A'B'C'$?



A) translation
B) dilation
C) reflection
D) rotation

3) In the diagram below, $\triangle ABC$ is similar but *not* congruent to $\triangle A'B'C'$. What type of transformation is represented by $\triangle A'B'C'$?



A) dilation
B) reflection
C) rotation
D) translation

4) Under what type of transformation is size *not* preserved?

A) rotation
B) dilation
C) translation
D) reflection

5) A rotation of a figure can be considered

A) a mirror image of the figure
B) a slide of the figure
C) an enlargement or a reduction of the figure
D) a turning of the figure about some fixed point

6) If the letter p is rotated 180 degrees, which of the following is the resulting figure?

A) b
B) u
C) ɑ
D) d

7) The *best* description of a dilation of a figure is

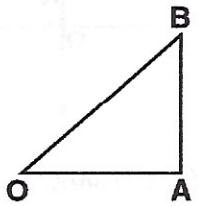
A) a slide of the figure
B) an enlargement or a reduction of the figure
C) a mirror image of the figure
D) a turning of the figure about some fixed point

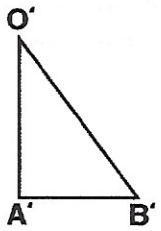
8) What type of transformation is represented by the illustration?

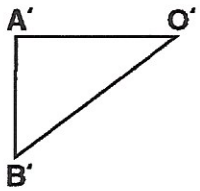
A → A

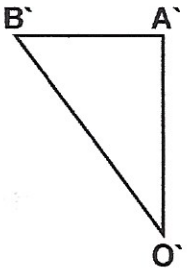
A) dilation
B) reflection
C) rotation
D) translation

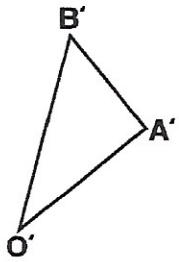
9) In the accompanying diagram, if $\triangle OAB$ is rotated counterclockwise 90° about point O, which one of the following figures represents the image of this rotation?



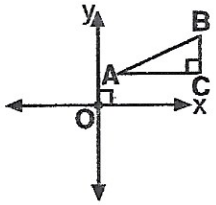
A)


B)


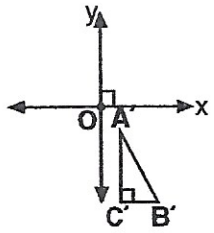
C)


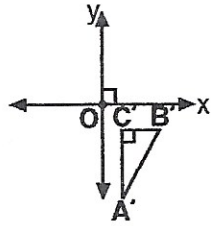
D)


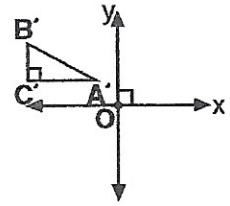
10) In the accompanying diagram, $\triangle ABC$ is a right triangle.

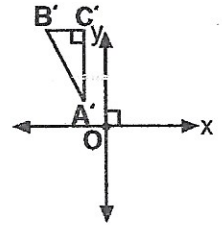


Which one of the following diagrams represents the image of $\triangle ABC$ when rotated 90° counterclockwise about the origin?

A)


B)


C)


D)


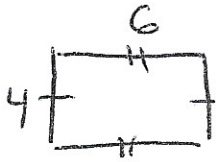
11) Under what type of transformation can the image be a different size than the original figure?

A) rotation
B) translation
C) dilation
D) reflection

12) Find the image of (3,-2) under the dilation D_2.

13) Find the image of $(-6, 4)$ under the dilation $D_{\frac{1}{2}}$.

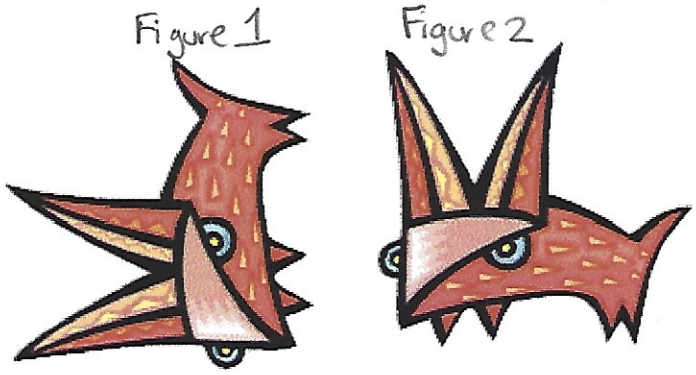
14) What would the new dimensions of the rectangle below be after a dilation of D_2?



Name:_____ Date:_____

8R Period____

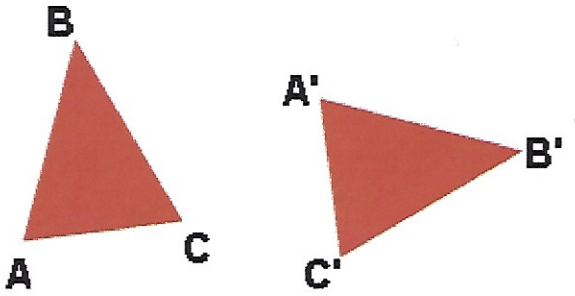
ROTATIONS



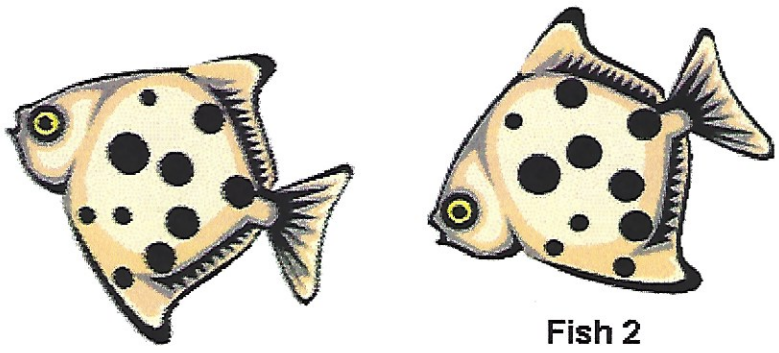
1)

Has this drawing been rotated 180 degrees?

2) This triangle has been rotated in a clockwise direction. True or False?



3) Fish 2 is a 45 degree counter-clockwise rotation of fish one? True or False?

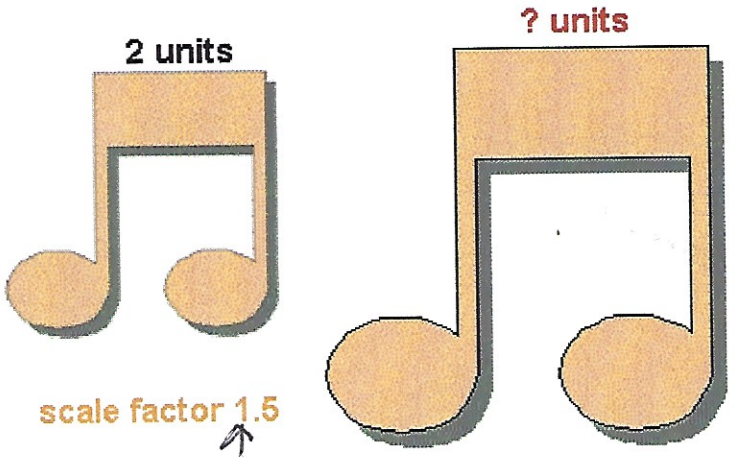


Fish 1

Fish 2

DILATIONS

1) Is this an example of a dilation?

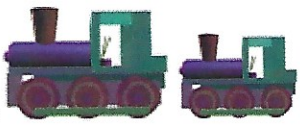


*Remember Scale factor is what you multiply by!

2)

Under the dilation shown at the left, the value of the "?" will be:

- ○ 1.5
- ○ 3
- ○ 4



3) The length of the small train is 4 inches. Under a dilation of scale factor 2, what is the length of the large train?