NAME:_____ Math _____, Period_____

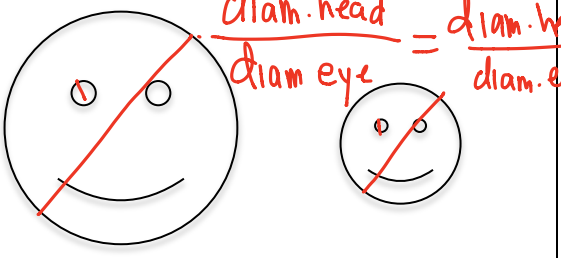
Mr. Rogove Date:_____

LEARNING OBJECTIVE: We will explore similarity in geometric figures. (G8M3L1)

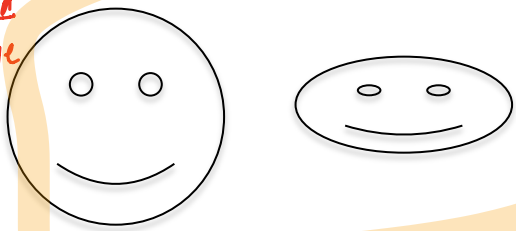
CONCEPT DEVELOPMENT:

Similarity: Two geometric figures are considered to be similar if they are proportional to each other.

Example:



Non-Example:



Dilation: A transformation of the plane with center O, while the scale factor r, $(r > 0)$ is a rule that assigns each point P of the plane a point $Dilation\ (P)$ so that:

- $Dilation\ (O) = O$ (i.e. the dilation does not move the center)
- If $P \neq 0$, then $dilation\ (P)$ (which can be written as P') is the point on the ray $\overrightarrow{OP}$ so that $|OP'| = r|OP|$.

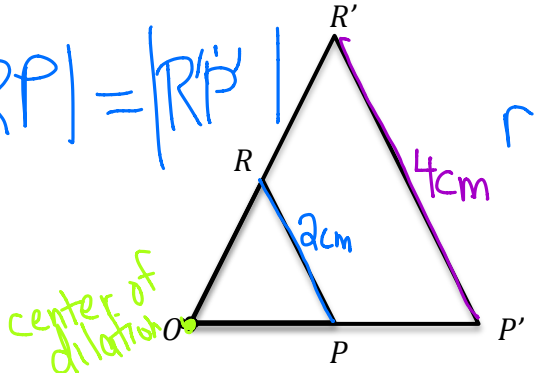
Transformations
Rigid
rep. rot. tran.
Not rigid
dilation
stretch shrink

Example:

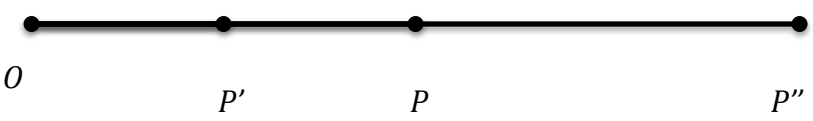
scale factor

$|RP| = |R'P'|$

$r = 2$



The dilation is a rule that moves points in a plane a specific distance determined by the scale factor, r. If $0 < r < 1$, the point in the plane is pulled toward the center proportionally the same amount. If $r > 1$, every point in the plane is pushed away from the center.



$\overline{OP} = 2$ in.

$r = \frac{1}{2}$, $\overline{OP'} = 1$ in

OP *dilated by a scale factor of* $\frac{1}{2}$ *is* OP'

OP *dilated by a scale factor of* 2 *is* OP''

1 $r = 2$, $\overline{OP''} = 4$ in.

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GUIDED PRACTICE:

Steps for Determining Dilations by Finding Scale Factors

1. Identify the given information:
   - The length of the original segment
   - The length of the dilated segment
   - The scale factor

Dilation = scale × original

2. Substitute the given information into a formula: $|OP'| = r|OP|$.

> 1

< 1

Given $|OP| = 5$ *inches*. If segment OP is dilated by a scale factor of 4, what is the length of OP'?

$OP' = r \cdot OP$

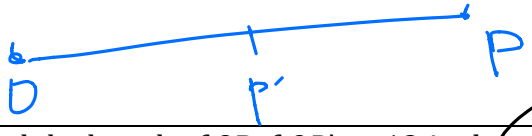
$OP = 4 \cdot 5$ $OP' = 20$ in.

Given $|OP| = 51$ *inches*. If segment OP is dilated by a scale factor of 3, what is the length of OP'?

$OP' = 153$ in.

$51 \cdot 3 = 153$

Given $|OP| = 16$ *inches*. If segment OP is dilated by a factor of $\frac{1}{2}$ what is the length of OP'? $OP' = \frac{1}{2} \cdot 16 = 8$ inches



Given $|OP| = 33$ *inches*. If segment OP is dilated by a factor of $\frac{1}{3}$ what is the length of OP'?

$\frac{1}{3} \cdot 33 = 11$ $OP' = 11$ inches

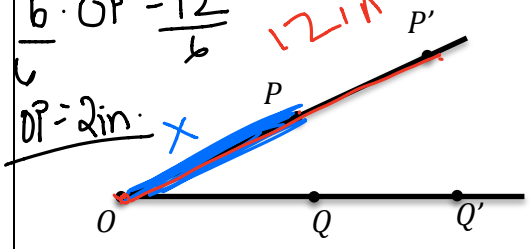
Find the length of OP if $OP' = 12$ *inches* and $r = 6$

$r \cdot OP = OP'$

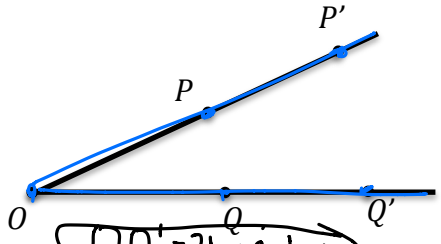
$\frac{6 \cdot OP}{6} = \frac{12}{6}$

$OP = 2$ in. ×

12 in



Find the length of OQ' if $OQ = 18$ *inches and* $r = 2$



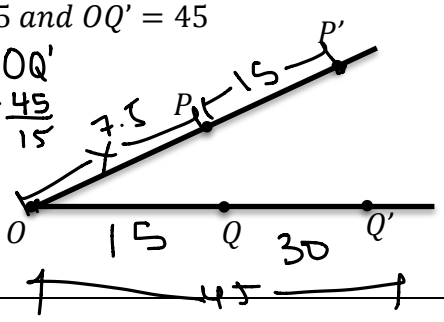
$OQ' = 36$ inches

Find the scale factor if $OQ = 15$ *and* $OQ' = 45$

$r \cdot OQ = OQ'$

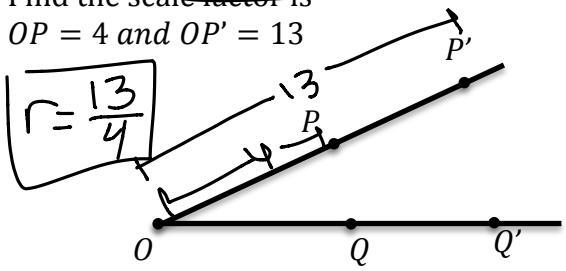
$\frac{r \cdot 15}{15} = \frac{45}{15}$

$r = 3$



Find the scale factor is $OP = 4$ *and* $OP' = 13$

$r = \frac{13}{4}$



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Independent Practice:
Give exit ticket, questions 2 and 3 only.

Activating Prior Knowledge:

Closure:

Teacher Notes:
Homework can be problem set from Lesson 1. Module 3.

Number Talk:
16x24
8x48
4x96
12 x 32
3 x??