

1. Investigating the length and slope properties of dilation.

a) Calculate the length \overline{AB} . (reduced radical) b) Calculate the slope of \overline{AB} .

A (1,4) B (3,1)

$$dist = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(3 - 1)^2 + (1 - 4)^2}$$

$$d = \sqrt{(2)^2 + (-3)^2}$$

$$d = \sqrt{4 + 9}$$

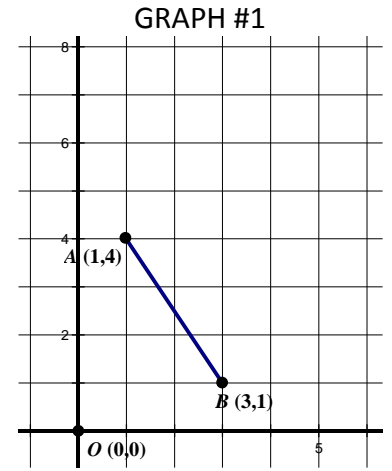
$$d = \sqrt{13}$$

A (1,4) B (3,1)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{1 - 4}{3 - 1}$$

$$m = \frac{-3}{2}$$



c) Dilate \overline{AB} about center O and scale factor of 2. (Graph it on graph #2)

d) Calculate the length $\overline{A'B'}$. (reduced radical) e) Calculate the slope of $\overline{A'B'}$.

A' (2, 8) B' (6, 2)

$$dist = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(6 - 2)^2 + (2 - 8)^2}$$

$$d = \sqrt{(4)^2 + (-6)^2}$$

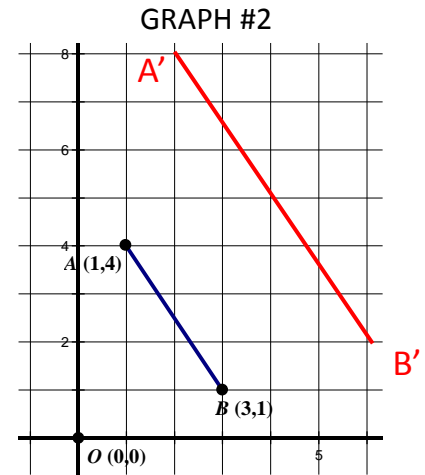
$$d = \sqrt{16 + 36} = \sqrt{52} = 2\sqrt{13}$$

A' (2, 8) B' (6, 2)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{2 - 8}{6 - 2}$$

$$m = \frac{-6}{4} = \frac{-3}{2}$$



How does this compare to AB?

Double

How does this compare to the slope of \overline{AB} ?

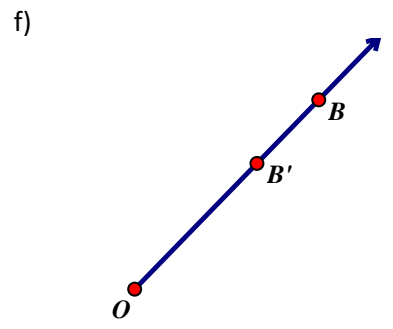
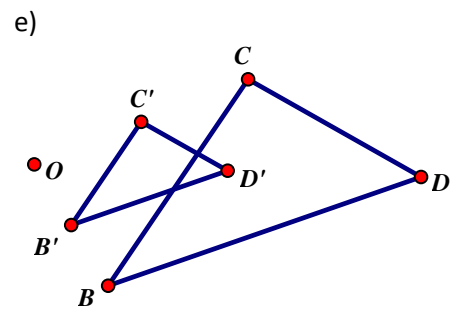
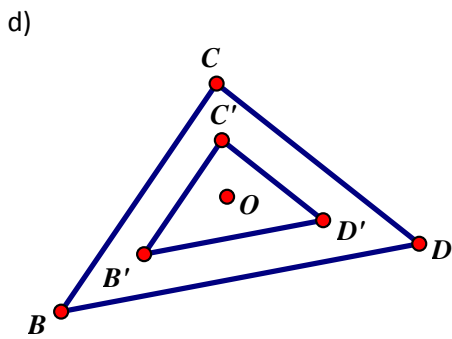
Same → parallel segments

2. Circle whether the following situations are REDUCTIONS or ENLARGEMENTS.

a) $D_{O, 1.75}(A) = A'$
 About the origin
 Reduction or **Enlargement**

b) Scale Factor of 3:2
 (pre-image : image)
Reduction or Enlargement

c) $D_{O, \frac{5}{3}}(G) = G'$
 Reduction or **Enlargement**



Reduction or Enlargement

Reduction or Enlargement

Reduction or Enlargement

Summary: Enlargements occur when $|n| > 1$. Reductions occur when $|n| < 1$.
 $|n| = 1 \rightarrow$ stays the same

3. the angle properties of dilation.

a) What is true about $\angle OAB$ and $\angle OA'B'$?	b) What is true about $\angle OBA$ and $\angle OB'A'$?
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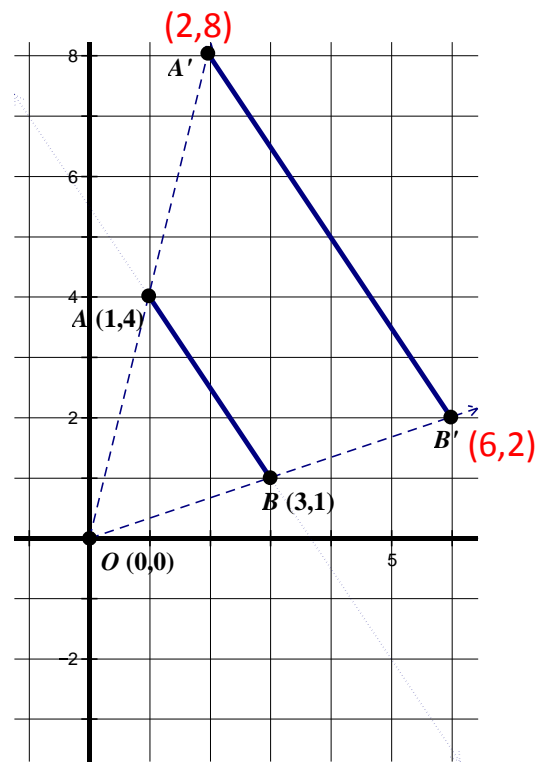
c) How do we know this relationship is valid?

\parallel lines \rightarrow corresponding angles \cong

d) What is the scale factor for the dilation that has occurred?

$n=2$

GRAPH #3



Do these relationships change when we dilate by a different value?

e) What is true about $\angle OAB$ and $\angle OA'B'$?	f) What is true about $\angle OBA$ and $\angle OB'A'$?
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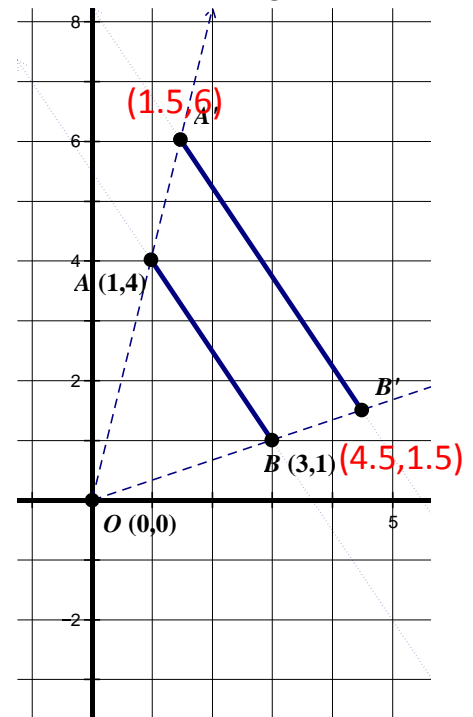
g) What is the scale factor for the dilation that has occurred?

$$\frac{1.5}{1} \text{ or } \frac{6}{4} \text{ or } \frac{4.5}{3} \Rightarrow n = 1.5$$

h) Does the scale factor affect the relationships that result from dilating?

No, other than segments are enlarged or reduced by different amounts.

GRAPH #4



Summary: When a dilation occurs:

- Distances/Lengths change according to the scale factor (n).
- Slopes stay the same which results in parallels.
- Angles stay the same.