

Name _____

Date _____

Line Dilations - [geogebra.org/m/uztkqep6](https://www.geogebra.org/m/uztkqep6)

Period _____

$\overleftrightarrow{A'B'}$ is the image of \overleftrightarrow{AB} after a dilation centered at $P(0,0)$ and a scale factor of 2.

Part I - You may only alter the slider (scale factor)

1. What happens to $\overleftrightarrow{A'B'}$ as you alter the scale factor? What happens when the scale factor is less than 1, equal to 1, greater than 1?

2. What kind of lines are $\overleftrightarrow{A'B'}$ and \overleftrightarrow{AB} when the scale factor is not equal to 1?

Part II - Refresh GeoGebra. Do not alter any values.

3. Write the equation of each line in slope-intercept form.

\overleftrightarrow{AB} _____ $\overleftrightarrow{A'B'}$ _____

4. Find the distance/length of each segment. $d = \sqrt{(\Delta x)^2 + (\Delta y)^2}$

\overline{PA} _____ $\overline{PA'}$ _____

\overline{PB} _____ $\overline{PB'}$ _____

\overline{AB} _____ $\overline{A'B'}$ _____

What can you conclude/what do you notice?

Part III - Refresh GeoGebra. You may only alter point P and the scale factor

5. Move point P around the graph, what happens to $\overleftrightarrow{A'B'}$? Do lines $\overleftrightarrow{A'B'}$ and \overleftrightarrow{AB} remain parallel? What is the exception?

6. Move point P to (2, 3).

What happens to $\overleftrightarrow{A'B'}$ as you alter the scale factor? What happens when the scale factor is less than 1, equal to 1, greater than 1?

7. Write the equation of each line in slope-intercept form.

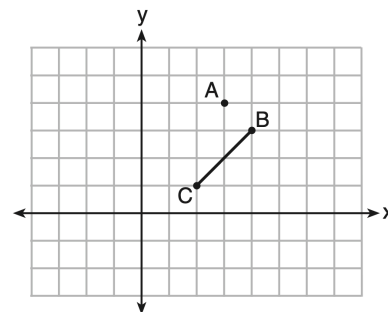
\overleftrightarrow{AB} _____ $\overleftrightarrow{A'B'}$ _____

8. What can you conclude about $\overleftrightarrow{A'B'}$ as the center of dilation P changes? What happens when P is on the pre-image line \overleftrightarrow{AB} ? What happens when P is **not** on the pre-image line \overleftrightarrow{AB} ?

9. A line segment is dilated by a scale factor of 2 centered at a point not on the line segment. Which statement regarding the relationship between the given line segment and its image is true?

- (1) The line segments are perpendicular, and the image is one-half of the length of the given line segment.
- (2) The line segments are perpendicular, and the image is twice the length of the given line segment.
- (3) The line segments are parallel, and the image is twice the length of the given line segment.
- (4) The line segments are parallel, and the image is one-half of the length of the given line segment.

10. On the graph below, point A(3,4) and \overline{BC} with coordinates B(4,3) and C(2,1) are graphed.



What are the coordinates of B' and C' after \overline{BC} undergoes a dilation centered at point A with a scale factor of 2?

- (1) $B'(5,2)$ and $C'(1,-2)$
- (2) $B'(6,1)$ and $C'(0,-1)$
- (3) $B'(5,0)$ and $C'(1,-2)$
- (4) $B'(5,2)$ and $C'(3,0)$