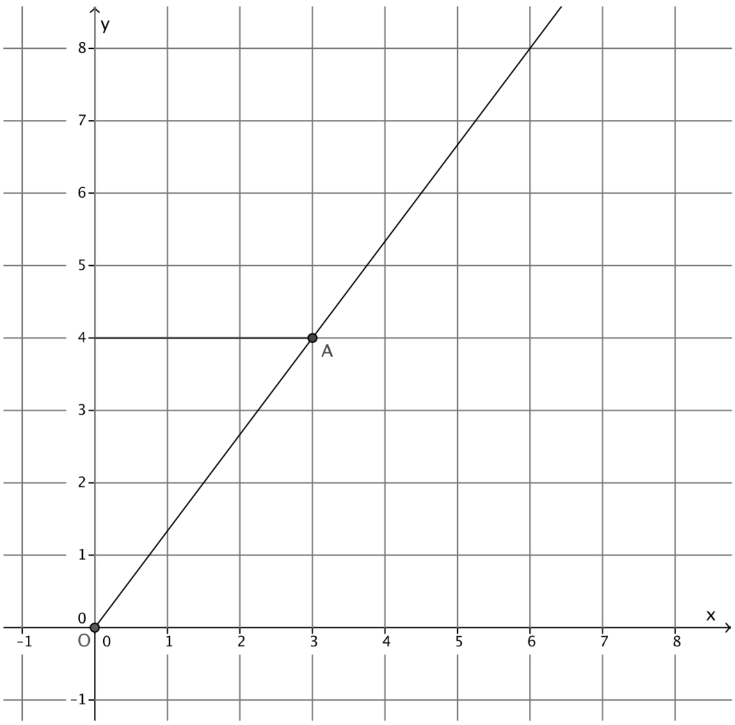
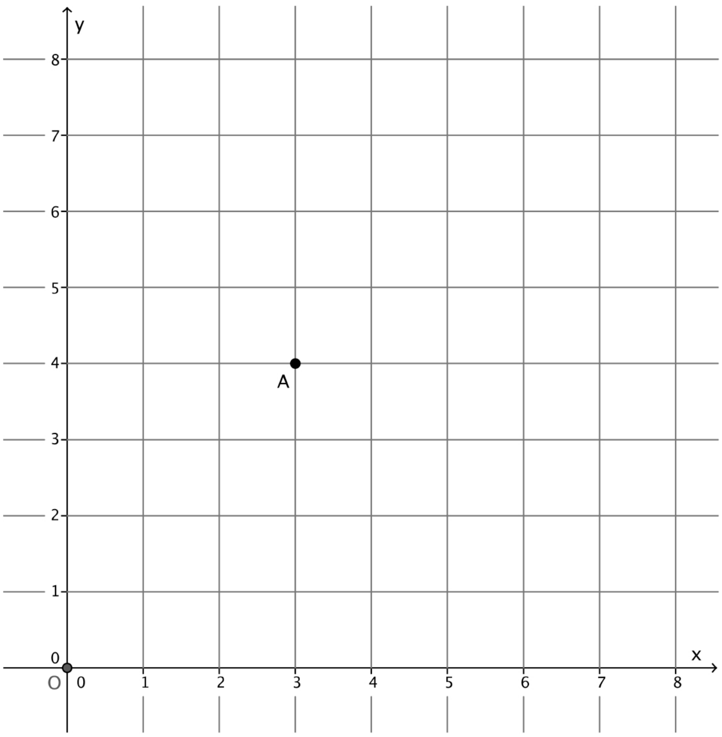
Name ______________________________________________ Date____________________

# First Consequences of FTS

In the diagram below, you are given center $O$ and ray $\overrightarrow{OA}$. Point $A$ is dilated by a scale factor $r = \frac{6}{4}$. Use what you know about FTS to find the location of point $A'$.

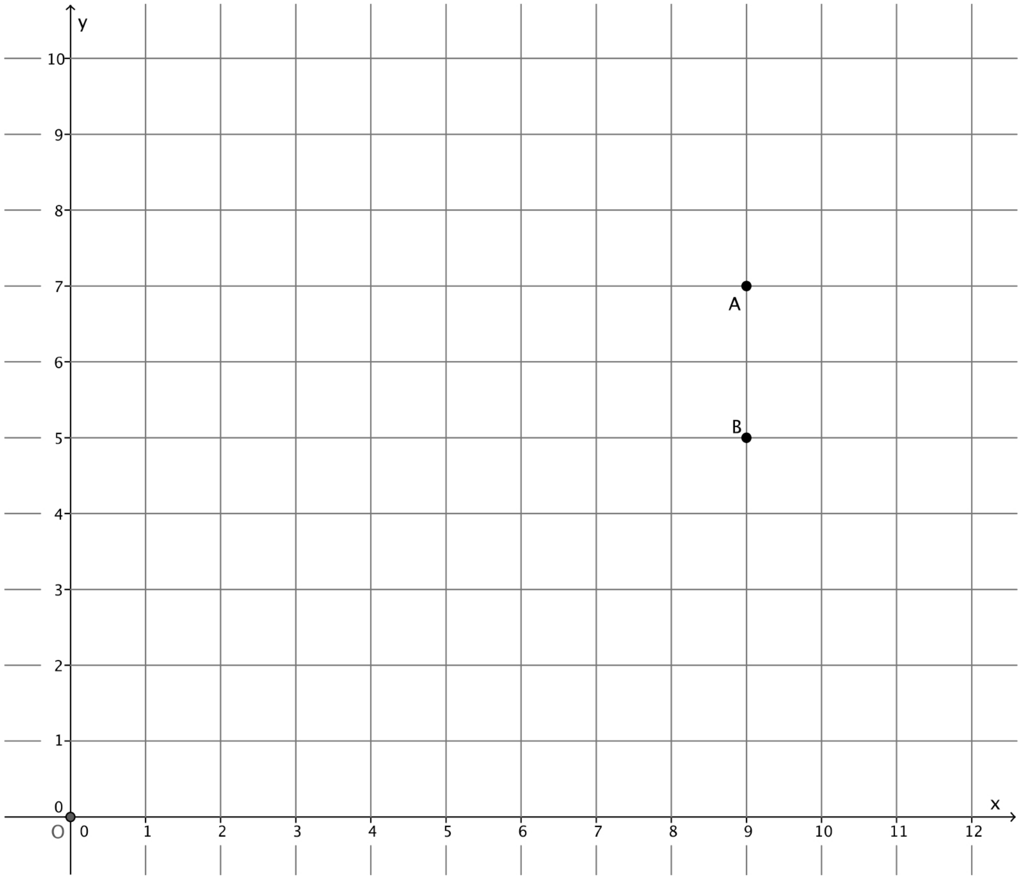


1. Dilate point $A$, located at $(3, 4)$ from center $O$, by a scale factor $r = \frac{5}{3}$.



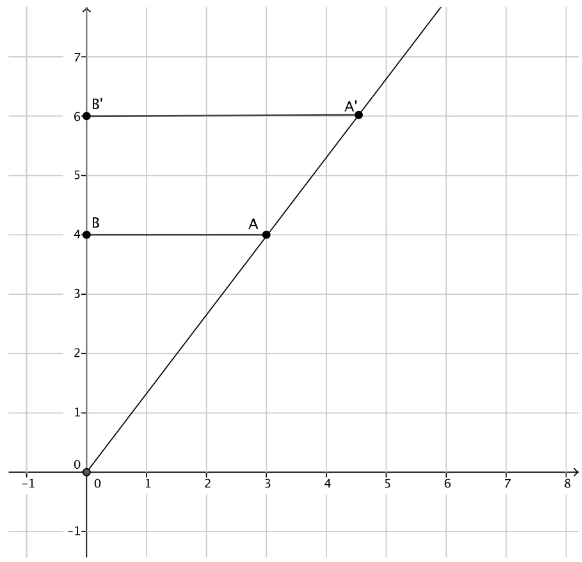
What is the precise location of point $A'$?

2. Dilate point $A$, located at $(9, 7)$ from center $O$, by a scale factor $r = \frac{4}{9}$. Then dilate point $B$, located at $(9, 5)$ from center $O$, by a scale factor of $r = \frac{4}{9}$. What are the coordinates of $A'$ and $B'$? Explain.




3. Explain how you used the Fundamental Theorem of Similarity in Problems 1 and 2.

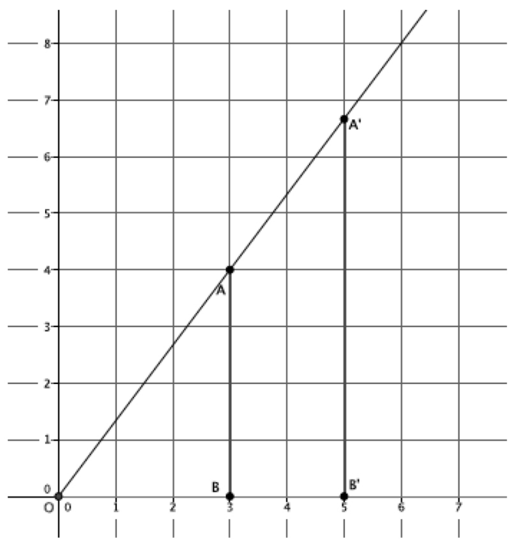
**In the diagram below, you are given center $O$ and ray $\overrightarrow{OA}$. Point $A$ is dilated by a scale factor $r = \frac{6}{4}$. Use what you know about FTS to find the location of point $A'$.**




*The $y$-coordinate of $A'$ is $6$. The $x$-coordinate will be equal to the length of segment $A'B'$. Since $|A'B'| = r|AB|$, then $|A'B'| = \frac{6}{4} \times 3 = \frac{18}{4} = 4.5$. The location of $A'$ is $(4.5, 6)$.*

Students practice using the first consequences of FTS in terms of dilated points and their locations on the coordinate plane.

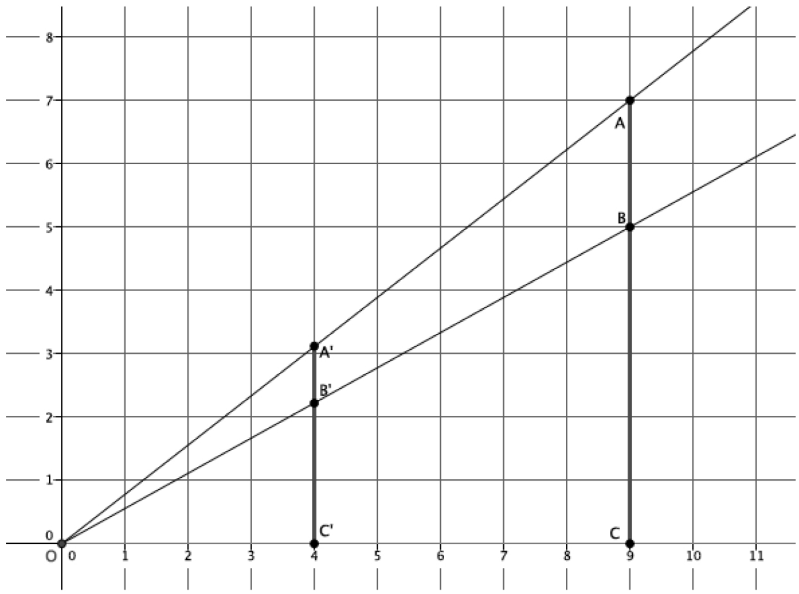
1. **Dilate point $A$, located at $(3, 4)$ from center $O$, by a scale factor $r = \frac{5}{3}$.**



**What is the precise location of point $A'$?**

*The $y$-coordinate of point $A'$ will be the length of segment $A'B'$. Since $|A'B'| = r|AB|$, then $|A'B'| = \frac{5}{3} \times 4 = \frac{20}{3}$. The location of point $A'$ is $\left(5, \frac{20}{3}\right)$, or approximately $(5, 6.7)$.*

2. **Dilate point $A$, located at $(9, 7)$ from center $O$, by a scale factor $r = \frac{4}{9}$. Then dilate point $B$, located at $(9, 5)$ from center $O$, by a scale factor of $r = \frac{4}{9}$. What are the coordinates of $A'$ and $B'$? Explain.**




*The $y$-coordinate of point $A'$ will be the length of $A'C'$. Since $|A'C'| = r|AC|$, then $|A'C'| = \frac{4}{9} \times 7 = \frac{28}{9}$. The location of point $A'$ is $\left(4, \frac{28}{9}\right)$, or approximately $(4, 3.1)$. The $y$-coordinate of point $B'$ will be the length of $B'C'$. Since $|B'C'| = r|BC|$, then $|B'C'| = \frac{4}{9} \times 5 = \frac{20}{9}$. The location of point $B'$ is $\left(4, \frac{20}{9}\right)$, or approximately $(4, 2.2)$.*

3. **Explain how you used the Fundamental Theorem of Similarity in Problems 1 and 2.**

*Using what I knew about scale factor, I was able to determine the placement of points $A'$ and $B'$, but I did not know the actual coordinates. So, one of the ways that FTS was used was actually in terms of the converse of FTS. I had to make sure I had parallel lines. Since the lines of the coordinate plane guarantee parallel lines, I knew that $|A'C'| = r|AC|$. Then, since I knew the length of segment $AC$ and the scale factor, I could find the precise location of $A'$. The precise location of $B'$ was found in a similar way but using $|B'C'| = r|BC|$.*