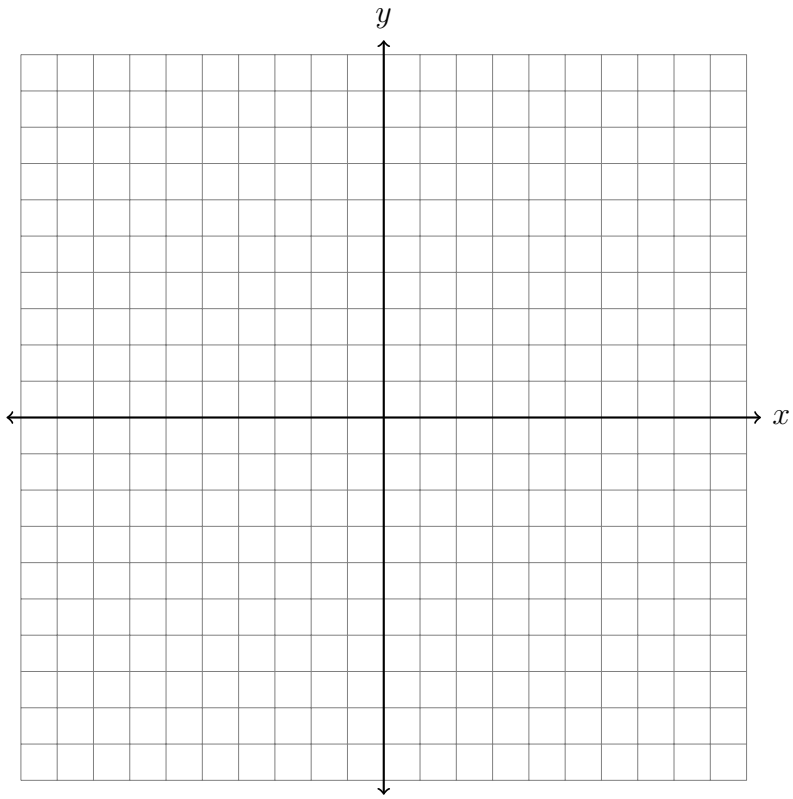
Do Now Quiz: Dilating a line segment, hexagon construction

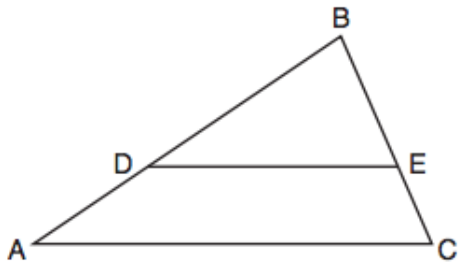
1. The coordinates of the endpoints of $\overline{AB}$ are $A(4, 1)$ and $B(0, 4)$. Determine the length of $\overline{A'B'}$, the image of $\overline{AB}$, after a dilation of 2 centered at the origin.

   Draw and label the two line segments, $\overline{AB}$ and $\overline{A'B'}$, on the set of axes below.



2. Regents problem:

In triangle ABC, points D and E are on sides $\overline{AB}$ and $\overline{BC}$, respectively, such that $\overline{DE} \parallel \overline{AC}$, and $AD{:}DB = 3{:}5$.



If $DB = 6.3$ and $AC = 9.4$, what is the length of $\overline{DE}$, to the *nearest tenth*?

3. Triangle ADE and its midline $\overline{BC}$ are drawn, with B the midpoint of $\overline{AD}$ and C the midpoint of $\overline{AE}$. The two medians $\overline{AE}$ and $\overline{AE}$ are drawn, as shown, intersecting in point F, the centroid.

$\triangle FCB \sim \triangle FDE$ with scale factor $k = 2$.

Given $BC = 7$, find DE.

Given $BF = 4$, find FE.