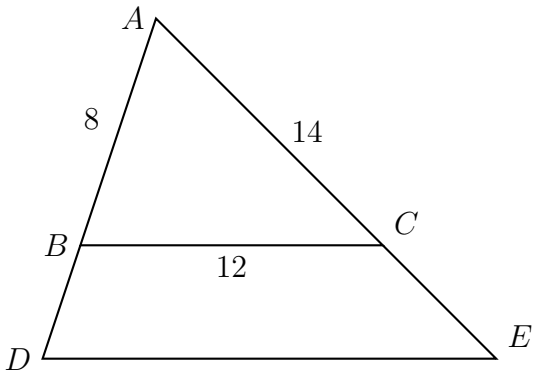
7.6 Homework: Similarity transformations and the tangent function

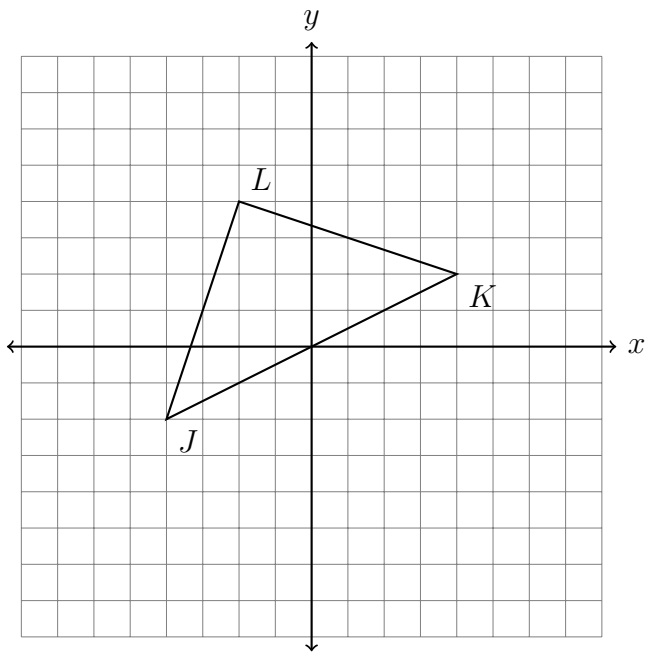
1. Triangle ABC is dilated with a factor of $\frac{5}{4}$ centered at A, yielding $\triangle ADE$, as shown. Given $AB = 8$, $BC = 12$, and $AC = 14$.

   Find BD, AE, and DE.

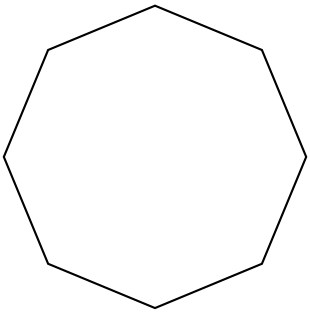


2. The vertices of $\triangle JKL$ have the coordinates $J(-4,-2)$, $K(4,2)$, and $L(-2,4)$, as shown.

   Apply a dilation to $\triangle JKL \to \triangle J'K'L'$, centered on the origin and with a scale factor $k = 1.5$. Draw the image $\triangle J'K'L'$ on the set of axes below, labeling the vertices, and make a table showing the correspondence of both triangles' coordinate pairs.



3. What is the smallest non-zero angle of rotation about its center that would map the octagon onto itself?



4. The vertices of $\triangle JKL$ have the coordinates $J(-4,-2)$, $K(-1,-1)$, and $L(-2,3)$, as shown below.

   Apply a translation of $(x,y) \rightarrow (x-3, y+2)$ to $\triangle JKL$ and then reflect the image across the y-axis. Draw both images $\triangle J'K'L'$ and $\triangle J''K''L''$ on the set of axes below, labeling the vertices.