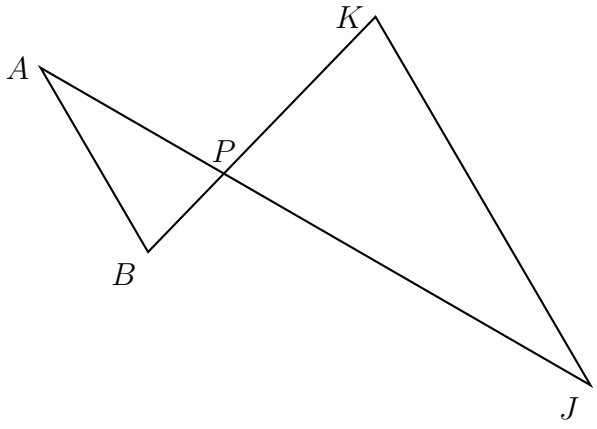
**9.8 Classwork: Similarity ratios, dilation, transformations, symmetry**

1. Two triangles are shown with $P$ the intersection of $\overline{AJ}$ and $\overline{BK}$.

   (a) Justify $\angle APB \cong \angle JPK$.

   (b) What angle must be congruent to $\angle B$ to prove $\triangle ABP \sim \triangle JKP$ by *angle-angle similarity*?

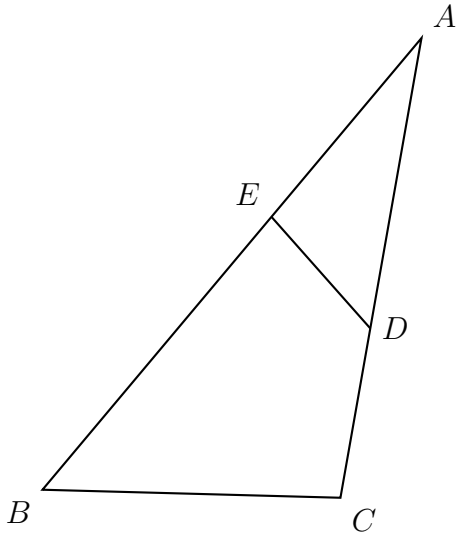



2. Given $\triangle PQR \sim \triangle STU$, $m\angle P = 37°$, and $m\angle T = 46°$. Find $m\angle Q$.

3. The diagram below shows $\triangle ABC$, with $\overline{AEB}$ and $\overline{ADC}$.

   (a) Justify $\angle BAC \cong \angle DAE$.

   (b) What angle must be congruent to $\angle AED$ to prove $\triangle ABC \sim \triangle ADE$ by *angle-angle similarity*?

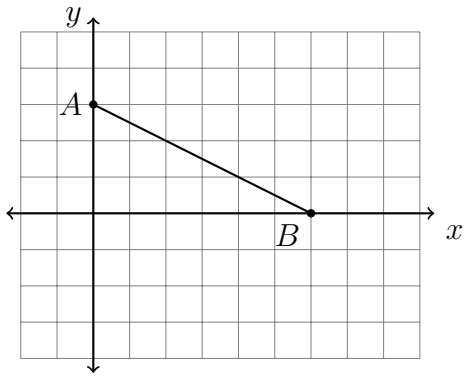


4. A dilation centered at the origin with scale factor $k = \frac{4}{3}$ maps $\overline{AB} \to \overline{A'B'}$.

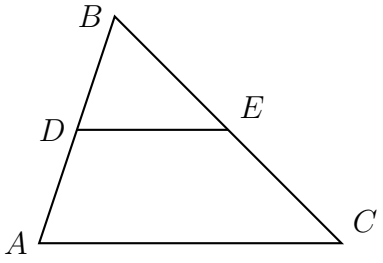
   (a) Draw and label the image.

   (b) What is the ratio of the length of $\overline{A'B'}$ to $\overline{AB}$?

   (c) What is the relationship of the slope of $\overline{A'B'}$ and $\overline{AB}$?




5. Given $\triangle ABC$, $D$ is the midpoint of $\overline{BA}$, $E$ is a point on $\overline{BC}$, and $\overline{DE}$ is drawn. If $BD = 8$ and $BE = 10$, what is the length of $\overline{BC}$ so that $\overline{AC} \parallel \overline{DE}$?



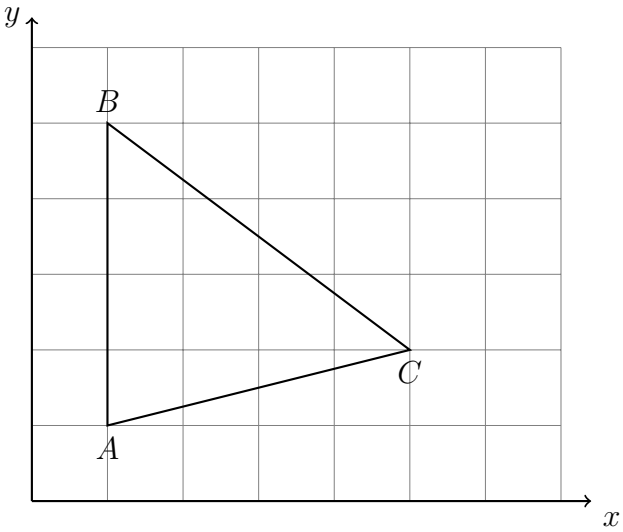

6. (a) In diagram below, each centimeter represents six inches. Find the length of each side in feet. (measure with a metric scale)

   i. $AB =$

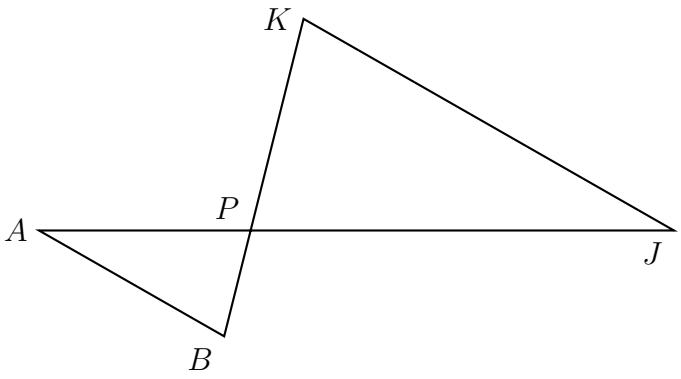
   ii. $BC =$

   iii. $AC =$

   iv. Find the area of $\triangle ABC$

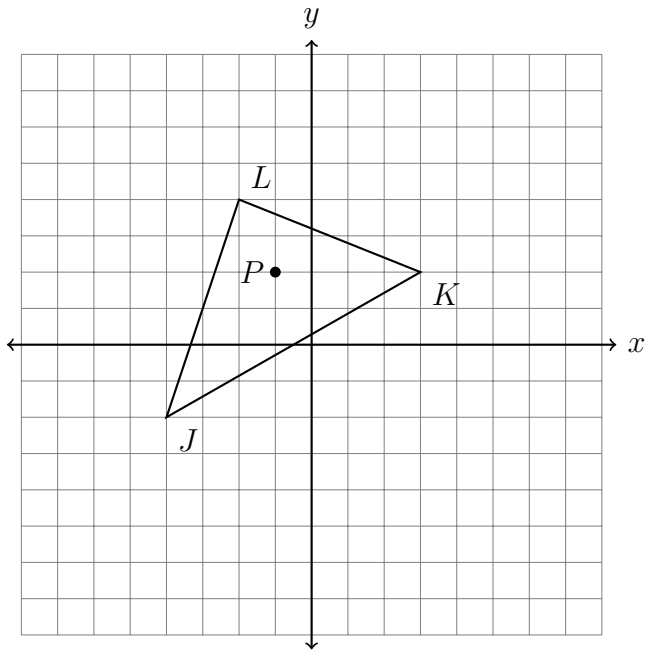


7. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 10.0$, $AP = 9.0$, $BP = 5$, and $AJ = 27.0$. Find $JK$.



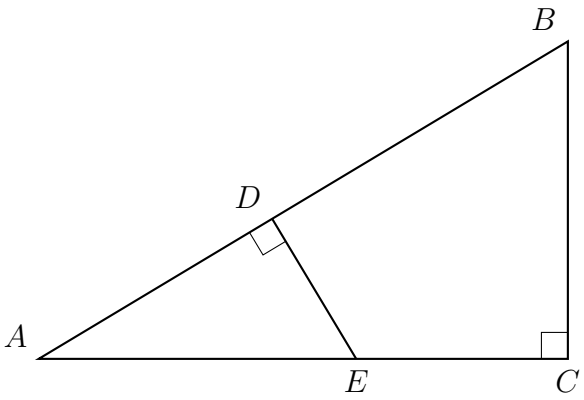

8. The vertices of $\triangle JKL$ have the coordinates $J(-4,-2)$, $K(3,2)$, and $L(-2,4)$, as shown.

   Apply a dilation to $\triangle JKL \rightarrow \triangle J'K'L'$, centered at $P(-1,2)$ and with a scale factor $k = 2$. 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.




   What is the ratio of the area of $\triangle JKL$ to $\triangle J'K'L'$?

9. In $\triangle ABC$ shown below, $\angle ACB$ is a right angle, $E$ is a point on $\overline{AC}$, and $\overline{ED}$ is drawn perpendicular to hypontenuse $\overline{AB}$.




If $AB = 9$, $BC = 6$, and $DE = 4$, what is the length of $\overline{AE}$?

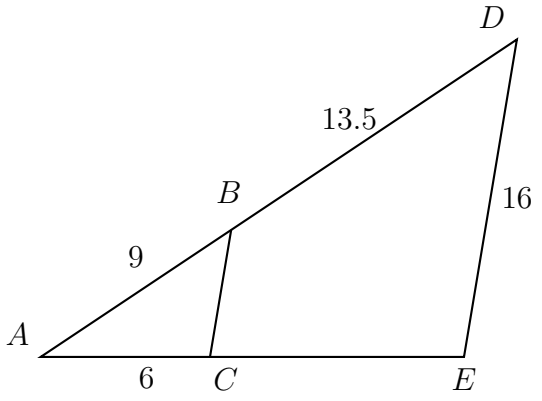
10. In the diagram below, $\angle ABC \cong \angle ADE$, $AB = 9$, $AC = 6$, $BD = 13.5$, and $DE = 16$. Find $AD$ and the scale factor $k$. Then find $AE$ and $BC$.

(a) $AD =$

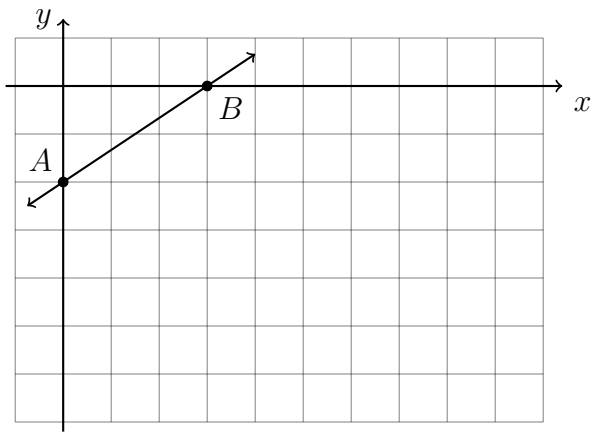
(b) $k =$

(c) $AE =$

(d) $BC =$



11. The line $\overleftrightarrow{AB}$ has the equation $y = \frac{2}{3}x - 2$. Apply a dilation mapping $\overleftrightarrow{AB} \to \overleftrightarrow{A'B'}$ with a factor of $k = 3$ centered at the origin. Draw and label the image on the grid. Write the equation of the line $\overleftrightarrow{A'B'}$.

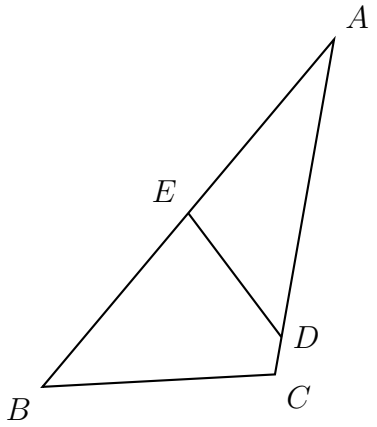



12. The diagram below shows $\triangle ABC$. $E$ bisects $\overline{AB}$, and $\angle ACB \cong \angle AED$. $AB = 18$, $AC = 12$, and $DE = 7$. Find the scale factor $k$, $BC$, and $AD$.

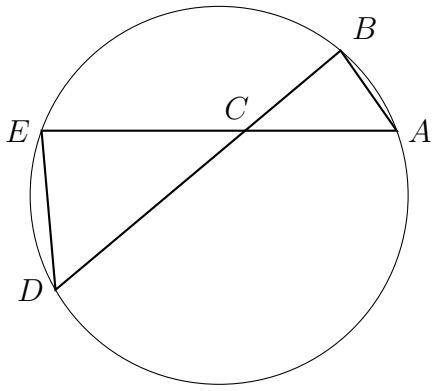
(a) $k =$

(b) $BC =$

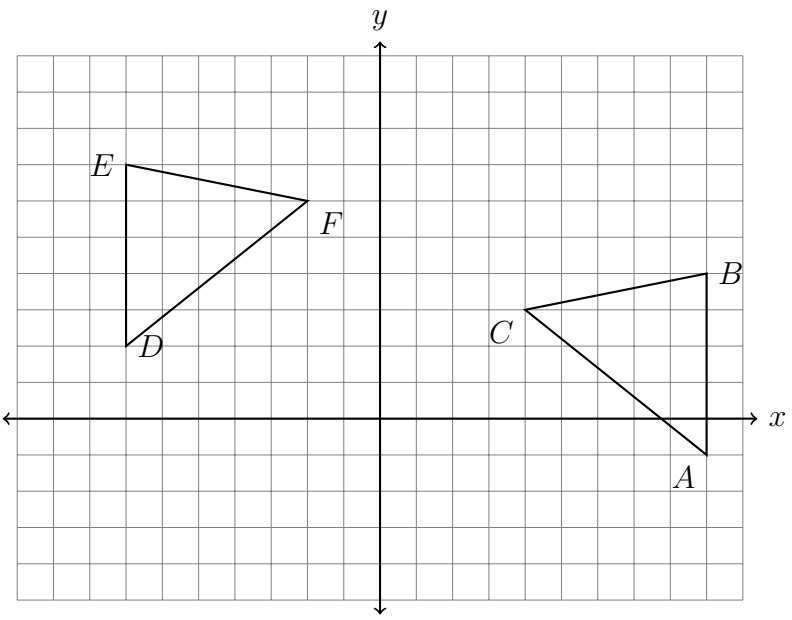
(c) $AD =$




13. In the diagram below, the chords $\overline{AE}$ and $\overline{BD}$ intersect at $C$. Given $\triangle ABC \sim \triangle DEC$, $BC = 6$, $CD = 12$, and $CE = 10$. Determine the length of $\overline{CA}$.



14. What transformation or series of transformations map $\triangle ABC$ onto $\triangle DEF$, shown below? Fully specify the transformation(s).




15. Reflect $\triangle ABC$ over the $y$-axis then dilate the resulting triangle by a factor of 2 centered at the origin.