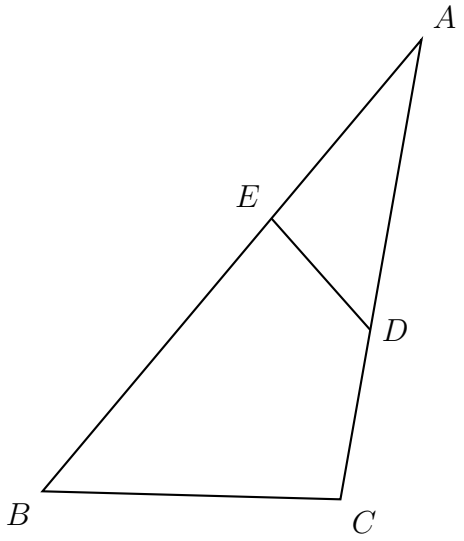
7.2 Homework: Similar triangles, dilations

1. The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$. $AB = 8$, $AD = 4$, and $DE = 2$.



   (a) $\triangle ADE \rightarrow$ _____

   (b) $\overline{AD} \rightarrow$ _____

   (c) What is the scale factor?

   $k =$ _____

   (d) What is the length of $\overline{BC}$?

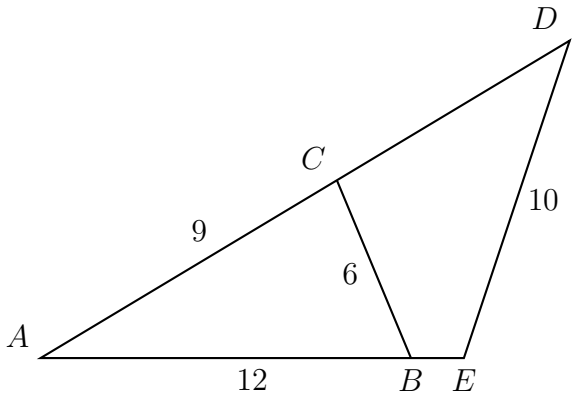
2. Given $\triangle ABC \sim \triangle ADE$ with sides $AC = 9$, $BC = 6$, $AB = 12$, and of $DE = 10$ find the scale factor k and the lengths AD and AE. Then find CD.

   (a) $k =$

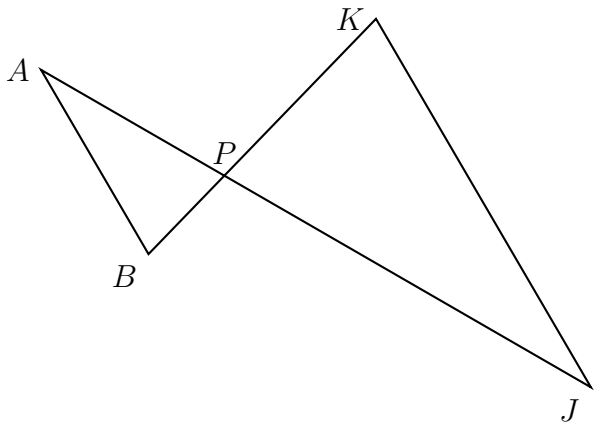
   (b) $AD =$

   (c) $AE =$

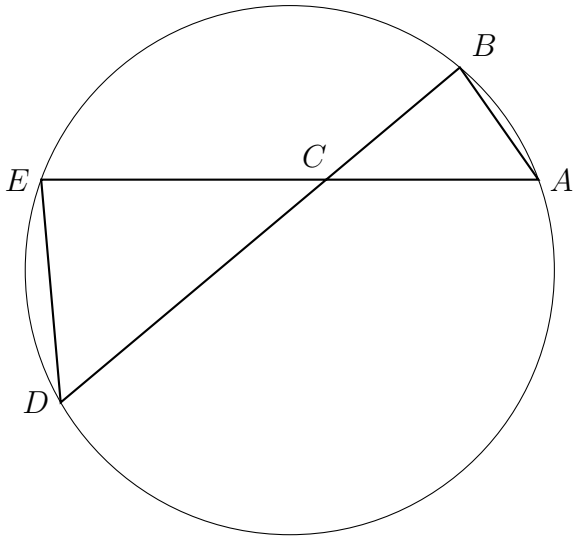
   (d) $CD =$



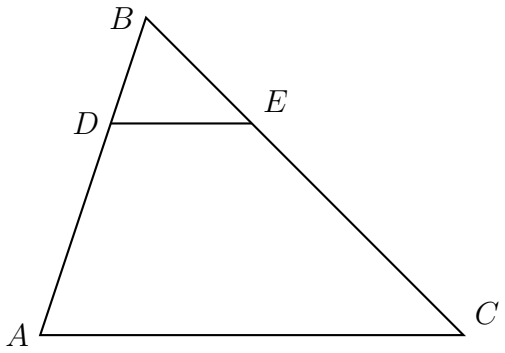
3. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 9.6$, $AP = 12.0$, $BP = 6.3$, and $JP = 18.0$. Find KP.



4. In the diagram below, the chords $\overline{AE}$ and $\overline{BD}$ intersect at C. Given $\triangle ABC \sim \triangle DEC$, $AB = 2$, $DE = 4$, and $AC = 3$. Determine the length of $\overline{CD}$.



5. In the diagram below of $\triangle ABC$, D is a point on $\overline{BA}$, E is a point on $\overline{BC}$, and $\overline{DE}$ is drawn.
   If $BD = 5$, $DA = 12$, and $BE = 7$, what is the length of $\overline{BC}$ so that $\overline{AC} \parallel \overline{DE}$?

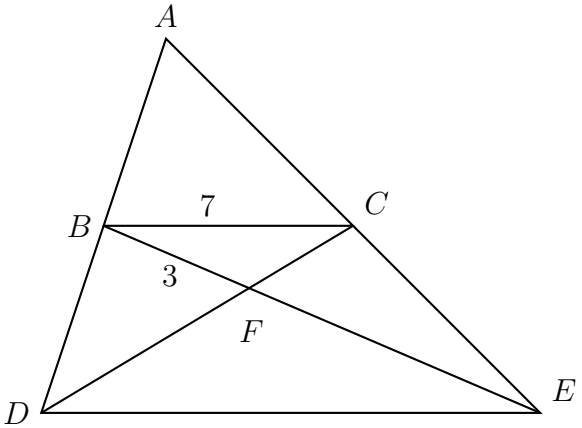


6. Triangle ADE and its midline $\overline{BC}$ are drawn, with B the midpoint of $\overline{AD}$ and C the midpoint of $\overline{AE}$. The two medians $\overline{BE}$ and $\overline{CD}$ are drawn, as shown, intersecting in point F, the centroid.

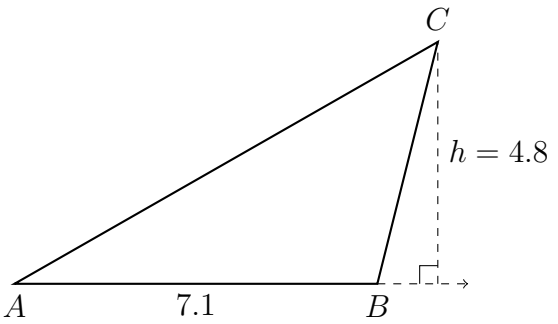
   $\triangle FCB \sim \triangle FDE$ with scale factor $k = 2$.

   Given $BC = 7$, find DE.

   Given $BF = 3$, find FE.

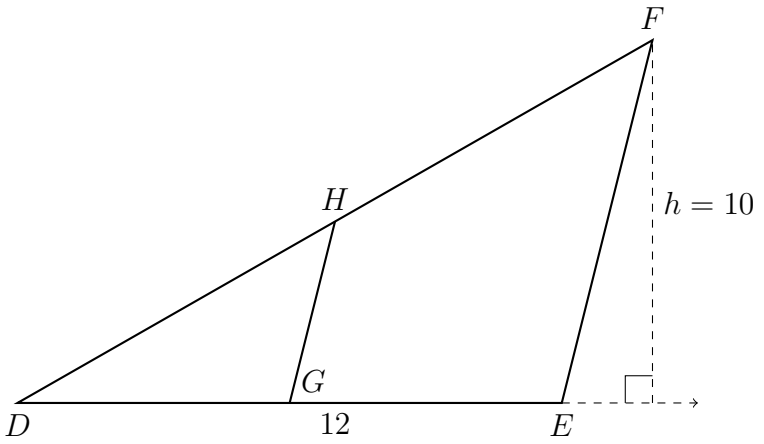


7. The side $\overline{AB}$ of triangle ABC is extended and an altitude to the vertex C is drawn, as shown below. The triangle's height is $h = 8.1$ and its base measures $AB = 13.4$. Find the area of the triangle.



8. Given $\triangle DEF$ with height $h = 10$ and base measuring $DE = 12$.

   (a) Find the area of $\triangle DEF$.



   (b) A dilation centered at D with $k = 0.5$ maps $\triangle DEF \to \triangle DGH$. Find the base and height of $\triangle DGH$ and its area.