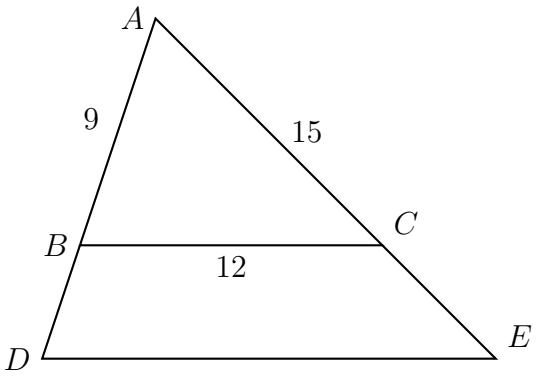
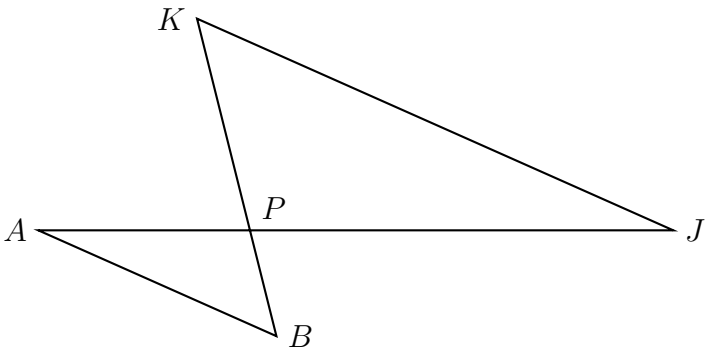
Classwork: Similar triangles, dilation ratios

1. Triangle ABC is dilated with a factor of $\frac{5}{3}$ centered at A, yielding $\triangle ADE$, as shown. Given $AB = 9$, $BC = 12$, and $AC = 15$.

   Find AD, AE, and DE.

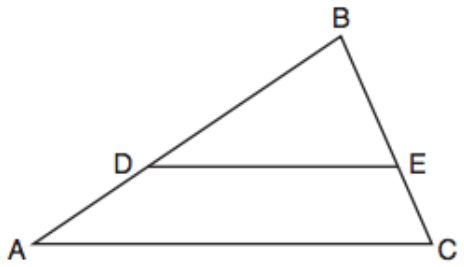


2. Given $\triangle ABP$ and $\triangle JKP$ as shown below. $\overline{AB} \parallel \overline{JK}$. $AP = 5.7$, $JP = 11.4$, and $JK = 14.8$. Find AB.



3. 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*?

4. 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.