

9.7 Classwork: Triangle midline and median

CCSS.HSG.SRT.B.5

1. Do Now: Triangle ABC is dilated with a factor of $\frac{3}{2}$ centered at A , yielding $\triangle ADE$, as shown. Given $AB = 10$, $BC = 12$, and $AC = 14$.

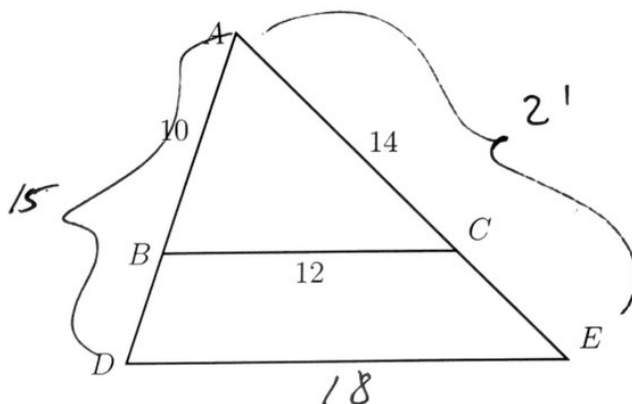
Find AD , AE , and DE .

$$\overline{AB} \rightarrow \overline{AD}$$

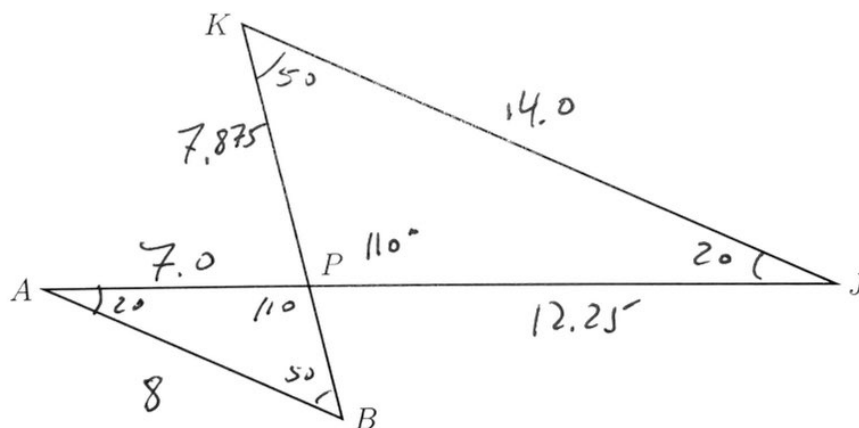
$$AD = \frac{3}{2}(10) = 15$$

$$AE = \frac{3}{2}(14) = 21$$

$$DE = \frac{3}{2}(12) = 18$$



2. Given $\triangle ABP \sim \triangle JKP$. $AB = 8$, $AP = 7.0$, $KP = 7.875$, $JK = 14.0$, $m\angle A = 20^\circ$, $m\angle JPK = 110^\circ$. Mark the given values on the diagram, find the scale factor, and solve the triangles (all angles and lengths).



$$K = \frac{14.0}{8} = 1.75$$

$$JP = 1.75(7.0) = 12.25$$

$$PB = \frac{7.875}{1.75} = 4.5$$

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{BE} and \overline{CD} are drawn, as shown, intersecting in point F , the centroid.

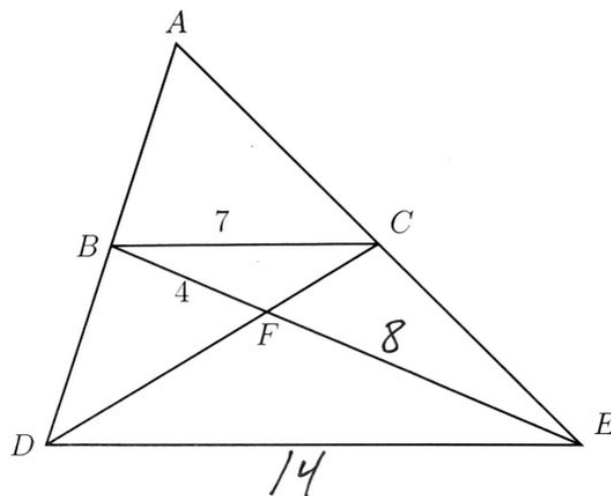
$\triangle FCB \sim \triangle FDE$ with scale factor $k = 2$.

Given $BC = 7$, find DE .

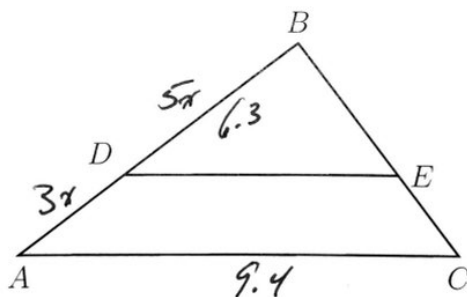
Given $BF = 4$, find FE .

$$DE = 2(7) = 14$$

$$FE = 2(4) = 8$$



4. 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?

$$DE = \frac{5}{8}(9.4) = 5.875$$

Name:

5. A dilation maps $\triangle ABC \rightarrow \triangle ADE$. Given $AB = 9$, $AC = 11.1$, $BC = 6$, $DE = 14$.

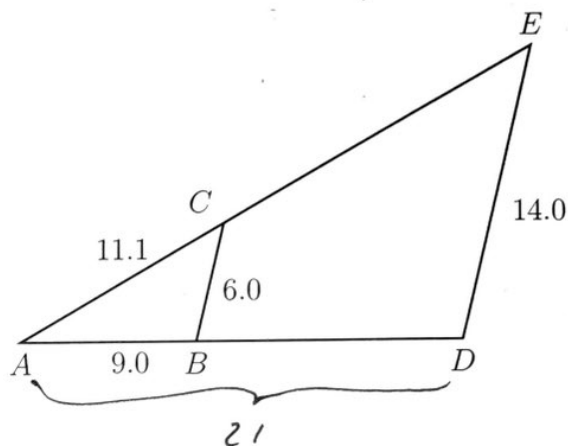
Find the scale factor and side lengths:

$$k = \frac{14}{6} = 2\frac{1}{3}$$

$$AD = (9)(2\frac{1}{3}) = 21$$

$$AE = (2\frac{1}{3})(11.1) = 25.9$$

$$BD = 21 - 9 = 12$$



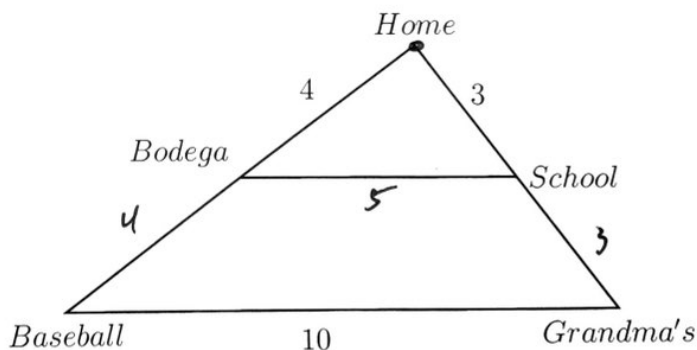
6. Steven and Marie live close to school and Tio's bodega, but also like to go to Grandma's house and the baseball field, which are further away. A sketch of the locations is shown below, essentially two triangles with a scale factor $k = 2$ centered at home.

From home it's 4 blocks to school and 3 to the bodega. From Grandma's to the baseball field is 10 blocks. There are twenty blocks to a mile.

- (a) Steven stops at the bodega on his way to school. How far does he walk, in terms of both blocks and miles?

$$\text{Blocks: } 4 + 5 = 9$$

$$\frac{9}{20} \text{ miles}$$



- (b) Marie goes to play baseball from school. Which way is shorter, passing by the bodega or the route by Grandma's? By how many blocks is it shorter? Justify your answer.

$$3 + 10 = 13$$

$$5 + 4 = 9$$

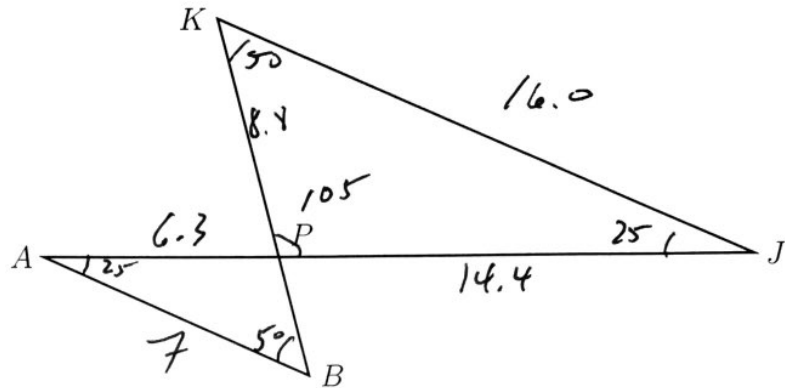
It is $13 - 9 = 4$ blocks shorter to pass by the Bodega

7. Given $\triangle ABP \sim \triangle JKP$. $AB = 7$, $AP = 6.3$, $KP = 8.8$, $JK = 16.0$, $m\angle A = 25^\circ$, $m\angle JPK = 105^\circ$. Solve the triangles (all angles and lengths).

$$K = \frac{16}{7} = 2\frac{2}{7}$$

$$JP = (2\frac{2}{7})(6.3) = 14.4$$

$$BP = \frac{8.8}{(16/7)} = 3.85$$



8. Triangle ADE is drawn with $\overline{BC} \parallel \overline{DE}$, as shown. Given $AB = 5$, $BC = 8$, $AC = 8$, and $BD = 5$. $m\angle A = 72^\circ$.

Find CE , AE , and DE . Find and mark all of the angle measures of the triangle.

$$K = 2$$

$$DE = 2(8) = 16$$

$$CE = 8$$

$$AE = 16$$

