

Name:

BECA / Dr. Huson / Geometry 7 Similarity

7.14 Exam: Similarity transformations

I can solve problems using similarity criteria.

CCSS.HSG.SRT.B.5

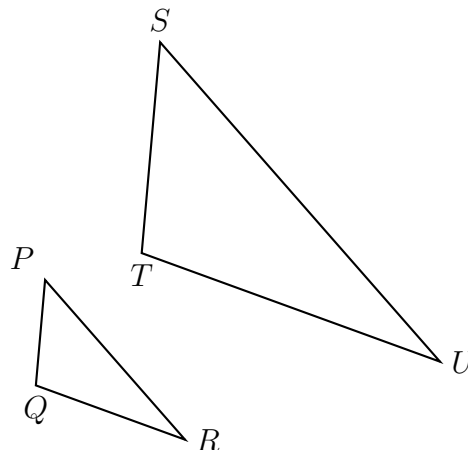
1. A dilation maps triangle PQR onto triangle STU with $QR = 6$ and $TU = 12$.

(a) $\overline{PR} \rightarrow$ _____

(b) What scale factor maps $\triangle PQR \rightarrow \triangle STU$?

(c) Given $PR = 8$, find SU .

(d) Given $ST = 6$, find PQ .



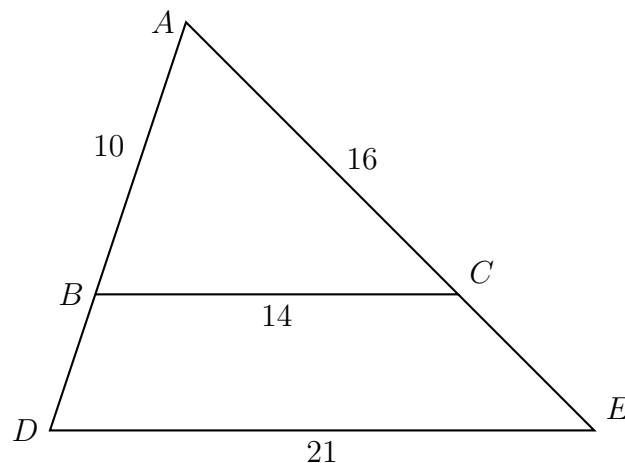
2. Given $\triangle ABC \sim \triangle DEF$, $m\angle A = 55^\circ$, and $m\angle B = 95^\circ$. Find $m\angle E$.

3. Triangle ABC is dilated with a scale factor of k centered at A , yielding $\triangle ADE$, as shown. Given $AB = 10$, $BC = 14$, $AC = 16$, and $DE = 21$.

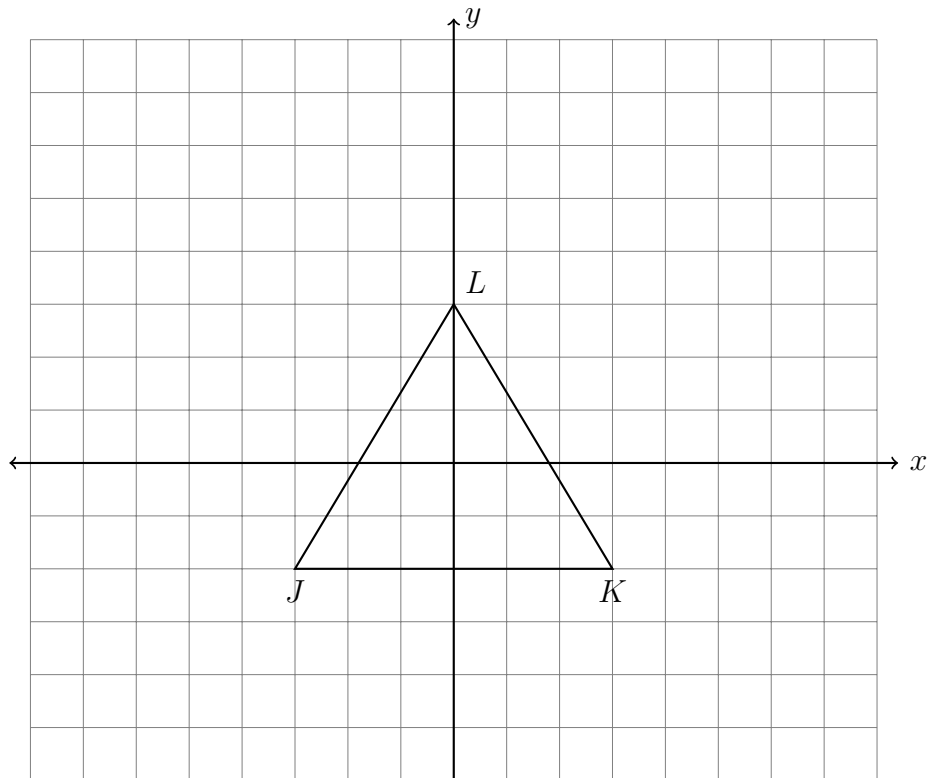
(a) Find the scale factor, k

(b) Find AD

(c) Find CE



4. Dilate $\triangle JKL$ with a scale factor $k = 2$ centered on the origin. Draw the image $\triangle J'K'L'$ and label its vertices. Given $J(-3, -2)$, $K(3, -2)$, and $L(0, 3)$.



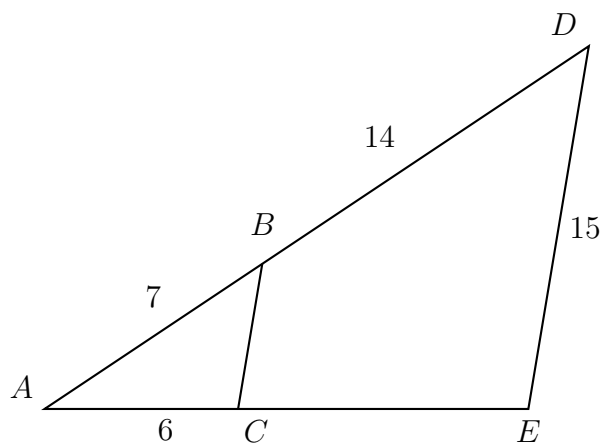
5. In the diagram below, $\angle ABC \cong \angle ADE$, $AB = 7$, $AC = 6$, $BD = 14$, and $DE = 15$. Find AD and the scale factor k . Then find AE and BC .

(a) $AD =$

(b) $k =$

(c) $AE =$

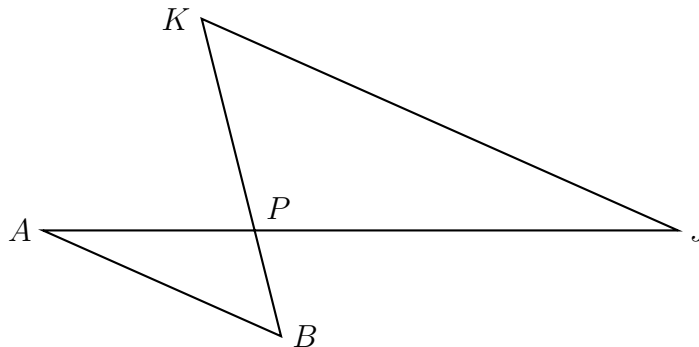
(d) $BC =$



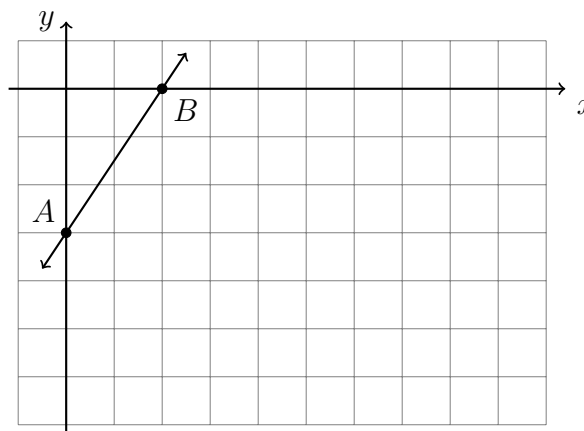
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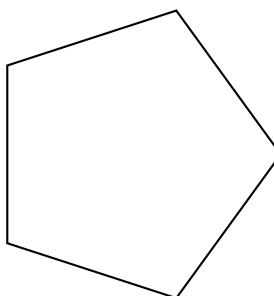
6. Given $\triangle ABP$ and $\triangle JKP$ as shown below. $\overline{AB} \parallel \overline{JK}$. $AP = 7.36$, $JP = 16.56$, and $JK = 18.9$. Find AB .



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



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



9. The diagram below shows $\triangle ABC$, with \overline{AEB} , \overline{ADC} , and $\angle ACB \cong \angle AED$. $AB = 14$, $AD = 8$, and $DE = 4$.

(a) $\overline{AE} \rightarrow$ _____

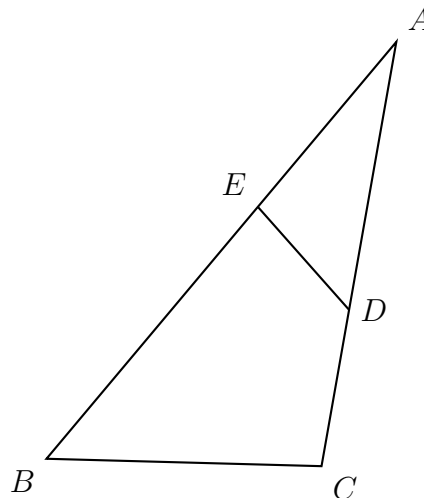
(b) $\overline{AD} \rightarrow$ _____

(c) $\triangle ADE \sim$ _____

(d) What is the scale factor?

$k =$ _____

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



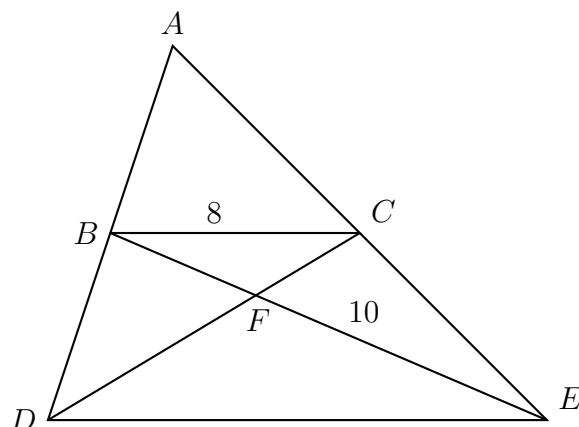
10. Triangle ADE and its midline \overline{BC} are drawn, with B the midpoint of \overline{AD} and C the midpoint of \overline{AE} . The two medians \overline{BE} and \overline{CD} are drawn, as shown, intersecting in point F , the centroid. Given $BC = 8$, $FE = 10$.

(a) Write down DE .

(b) Given $\triangle FCB \sim \triangle FDE$ with scale factor $k = 2$.

Find BF .

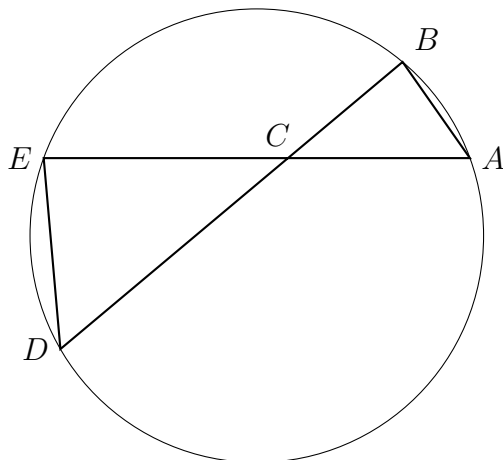
(c) Given the area of $\triangle FCB = 12.5$, find the area of $\triangle FDE$.



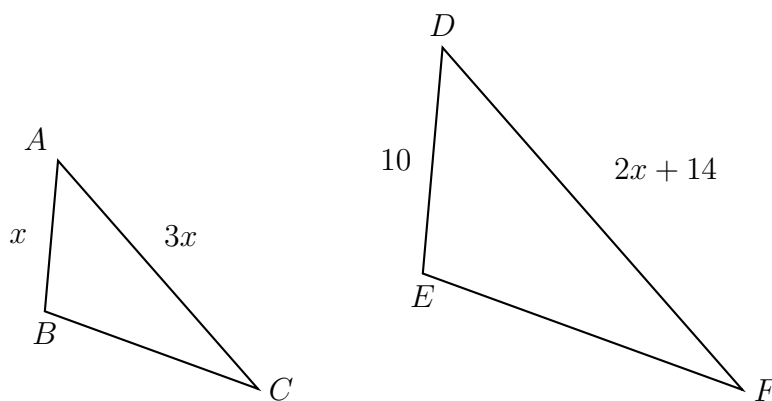
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11. In the diagram below, the chords \overline{AE} and \overline{BD} intersect at C , with $\triangle ABC \sim \triangle DEC$, $BC = 3.4$, $AC = 4.2$, and $BD = 9.35$. Determine the length of \overline{CE} .

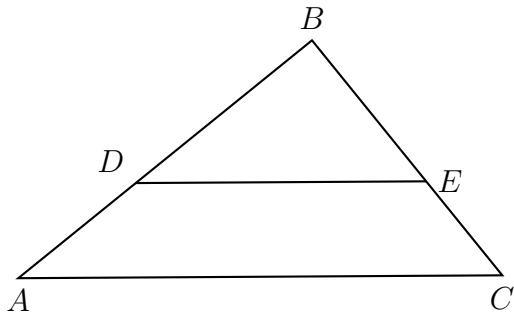


12. In the diagram below $\triangle ABC \sim \triangle DEF$, $DE = 10$, $AB = x$, $AC = 3x$, $DF = 2x + 14$. Determine the length of \overline{AB} .



13. In triangle ABC , points D and E are on sides of \overline{AB} and \overline{BC} , respectively, such that $\overline{DE} \parallel \overline{AC}$, and $BD : DA = 5 : 3$.

If $DB = 9.0$ and $DE = 10.5$, what is the length of \overline{AC} , to the *nearest tenth*?



14. In the diagram below $\triangle ABC \sim \triangle DEF$, $DE = x$, $AB = 3$, $AC = x - 1$, $DF = x + 7$. Find x .

