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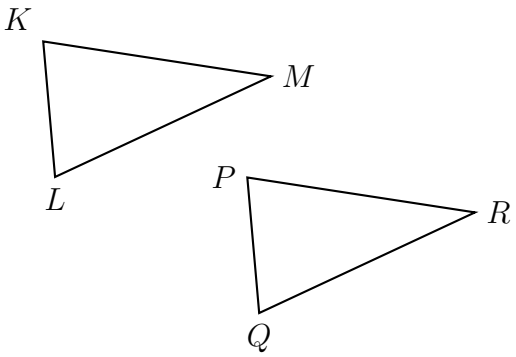
5-11Exam-Transformations

1. A translation maps triangle KLM onto triangle PQR.



(a) $L \rightarrow$ _____

(b) $\angle M \cong$ _____

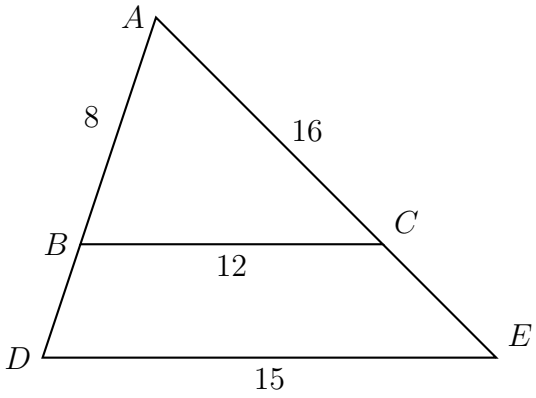
(c) _____ $\cong \overline{QR}$

(d) Justify $\triangle KLM \cong \triangle PQR$. Use the words "rigid motion" and "translation".

Write each corresponding object.

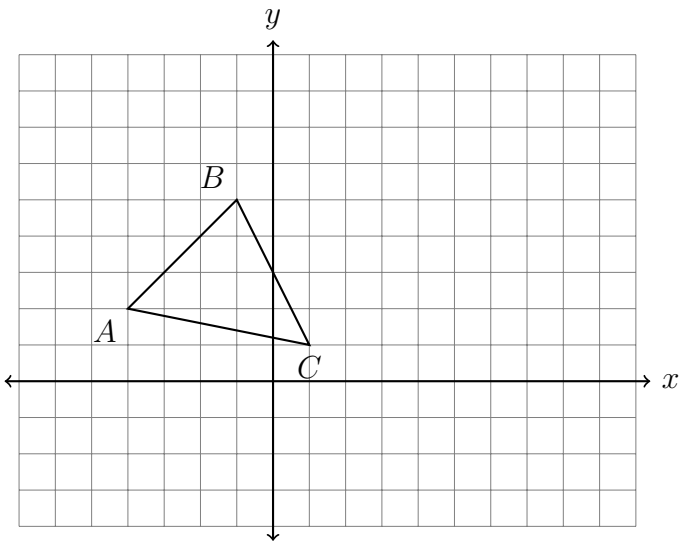
2. Triangle ABC is dilated with a scale factor of k centered at A, yielding $\triangle ADE$, as shown. Given $AB = 8$, $BC = 12$, $AC = 16$, and $DE = 15$.

   Find AD, CE, and k (the scale factor).

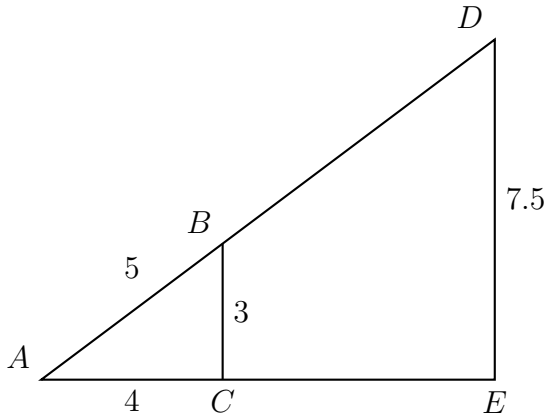


3. Find the image of $P(-4, 0)$ after the translation $(x, y) \rightarrow (x - 10, y + 2)$.

4. Translate $\triangle ABC$ by $(x, y) \to (x + 6, y - 3)$. Make a table of the coordinates and plot and label the image on the axes.



5. A dilation centered at A maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 4$, $BC = 3$, $AB = 5$, and of $DE = 7.5$ find the scale factor k and the lengths AD and AE.



6. Given $\triangle ABC \sim \triangle DEF$. $m\angle A = 40°$ and $m\angle E = 35°$. Find the measure of $\angle C$.

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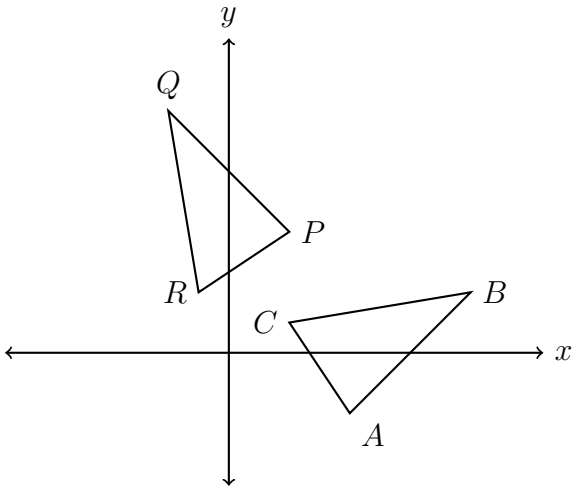
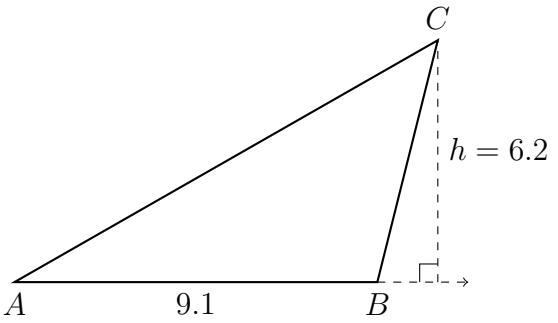
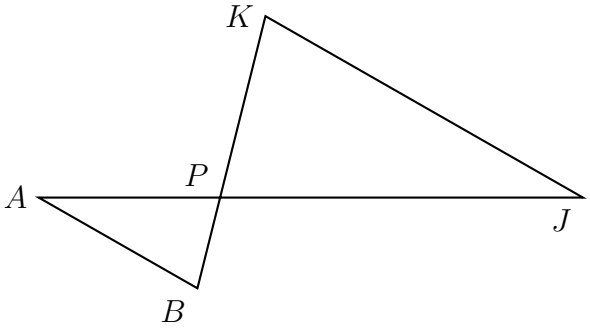
7. A rotation of 90° is applied to $\triangle ABC$, mapping it onto $\triangle PQR$, as shown. Which triangle has the larger area, or are they equal? Justify your answer.



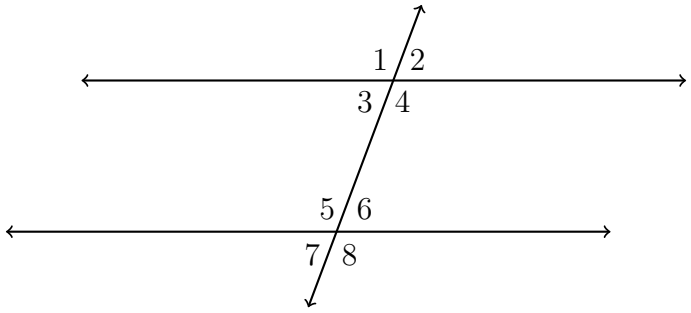
8. The side $\overline{AB}$ of triangle ABC is extended and an altitude to the vertex C is drawn, as shown below. The triangle's height is $h = 6.2$ and its base measures $AB = 9.1$. Find the area of the triangle.



9. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 11.2$, $AP = 8.9$, $BP = 5.0$, and $JK = 22.4$. Find JP.



10. Given two parallel lines and a transversal, as shown below.



(a) State the angle corresponding with $\angle 7$.

(b) What theorem would justify $m\angle 4 + m\angle 6 = 180°$? _____

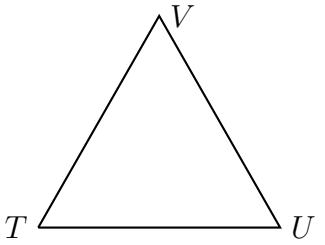
(c) What theorem would justify $\angle 3 \cong \angle 6$? _____

(d) Given $m\angle 1 = 117°$ and $m\angle 8 = (4x - 3)°$. Find x.

11. A translation maps $X(1, 7) \to X'(-3, 9)$. What is the image of $Y(0, -3)$ under the same translation?

12. Given isosceles $\triangle TUV$ with $\overline{TU} \cong \overline{UV}$ and $m\angle T = 55$. Find $m\angle U$ and $m\angle V$.

(*the diagram is not to scale*)



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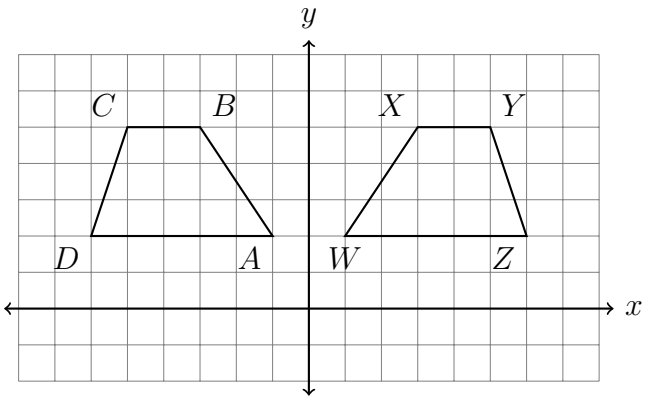
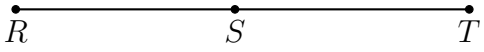
13. The trapezoid $ABCD$, shown below, undergoes a rigid transformation carrying it onto trapezoid $WXYZ$. State the transformation. (be specific)



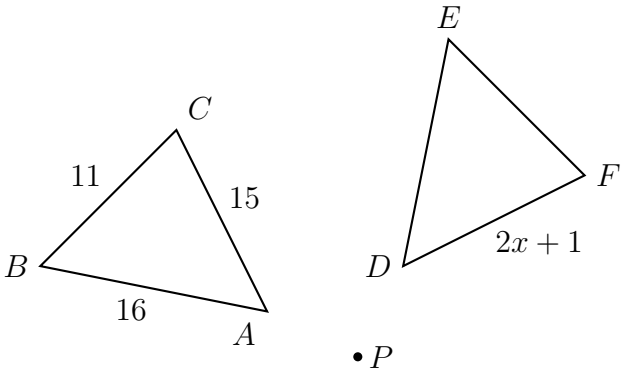
14. The points R, S, and T are collinear, with $RS = 4x - 8$, $ST = 21$, and $RT = 6x - 1$.

    Find RT.

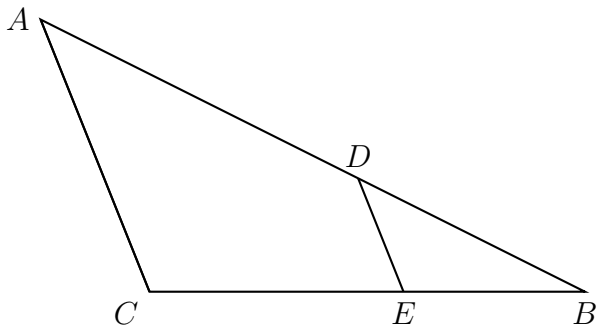


15. In the diagram below, $\triangle ABC$ with sides of 11, 15, and 16, is mapped onto $\triangle DEF$ after a clockwise rotation of 90° about point P.

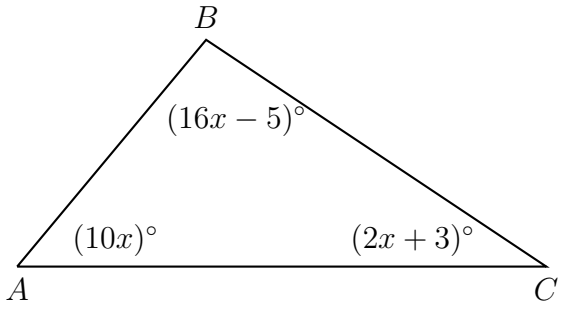
    If $DF = 2x + 1$, what is the value of x?



16. Given $\triangle ABC$ point D on $\overline{AB}$ and point E on $\overline{BC}$ such that $\triangle ABC \sim \triangle DBE$. If $AB = 15$, $BC = 10$, and $AD = 9$, what is the length of $\overline{BE}$?



17. In $\triangle ABC$ shown below, $m\angle A = (10x)°$, $m\angle B = (16x - 5)°$, and $m\angle C = (2x + 3)°$. Find $m\angle A$. (show the check for full credit)



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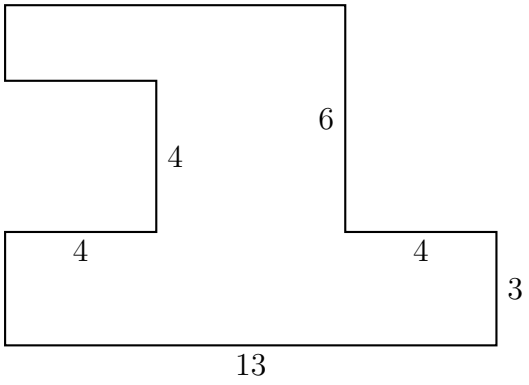
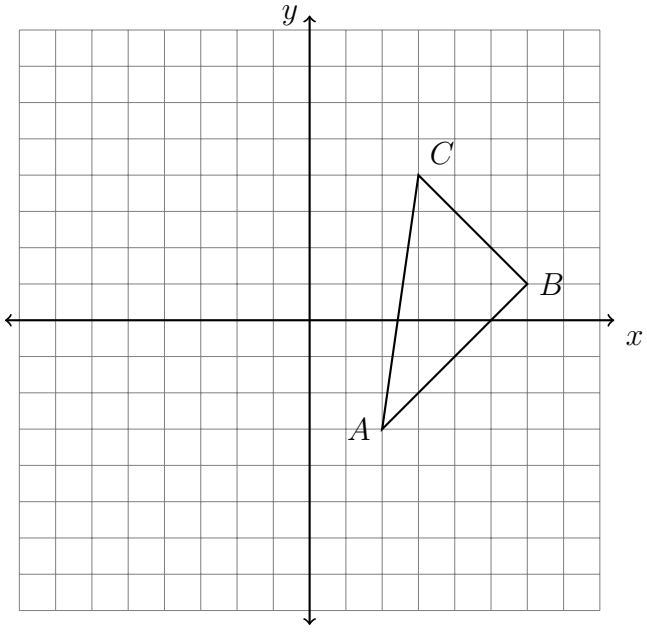
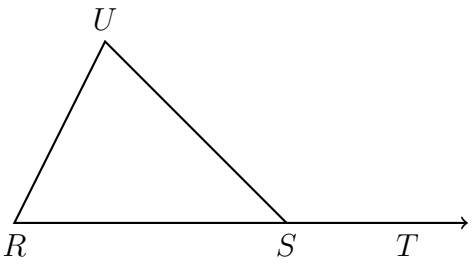
18. The shape shown below is composed of straight lines and right angles, with some lengths as marked. Find the area of the figure. (the figure is not drawn to scale)



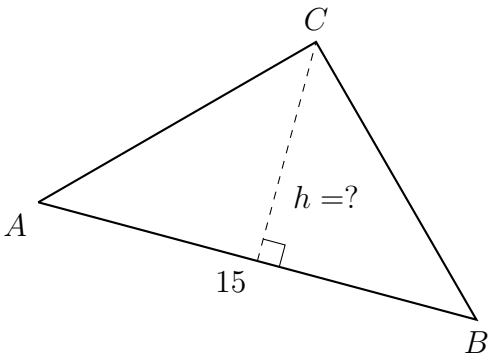
19. $\triangle ABC$ is shown with vertices $A(2,-3)$, $B(6,1)$, and $C(3,4)$. Reflect the triangle across the x-axis. Write down its coordinates in a table and plot and label it on the graph.



20. Given isosceles $\triangle RSU$ with $\overline{US} \cong \overline{RS}$. If $m\angle UST = 150$ find $m\angle U$.



21. One side of the $\triangle ABC$ has a length $AB = 15$. The triangle's area is $71\frac{1}{4}$. Find the length of the altitude h of the triangle to vertex C and perpendicular to side $\overline{AB}$.



22. The point K is the midpoint of $\overline{JL}$, $JK = 3x + 11$, and $JL = 9x + 1$. Find JK.

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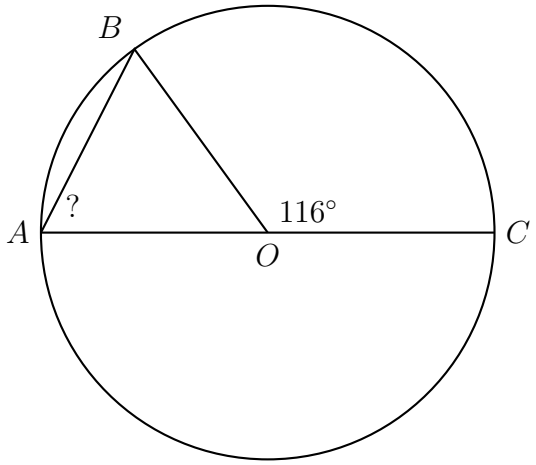
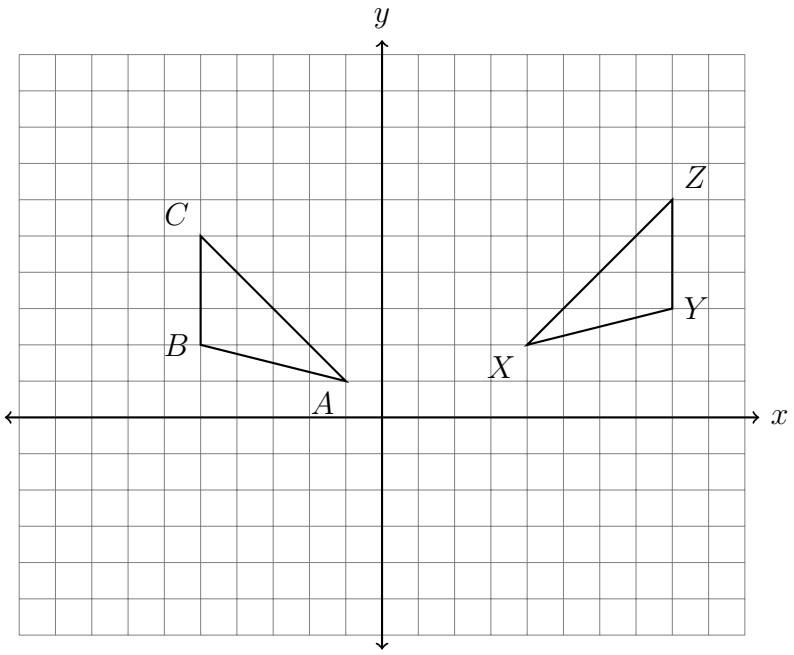
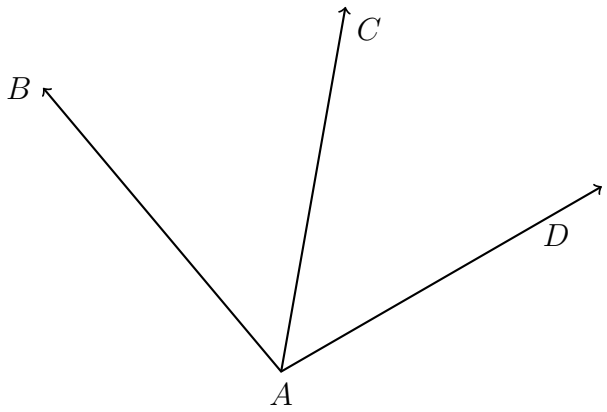
23. The circle O is shown below with diameter $\overline{AOC}$ and radius $\overline{BO}$. Given that the central angle $m\angle COB = 116°$. Find the measure of angle A, that is, $m\angle BAO$.



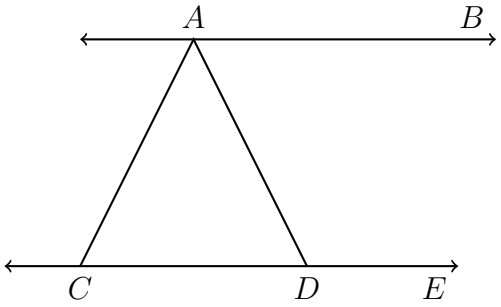
24. The triangle ABC, shown below, undergoes two rigid motions carrying it onto triangle XYZ. State the two isometric transformations. (be specific)



25. An angle bisector is shown below, with $\overrightarrow{AC}$ bisecting $\angle BAD$. Given $m\angle BAC = 6x+1$ and $m\angle BAD = 14x - 15$, find $m\angle BAD$. (Show check)



26. Given parallel lines $\overleftrightarrow{AB} \parallel \overleftrightarrow{CDE}$ with $\overline{AC} \cong \overline{CD}$. If $m\angle BAD = 68$ find $m\angle ACD$.



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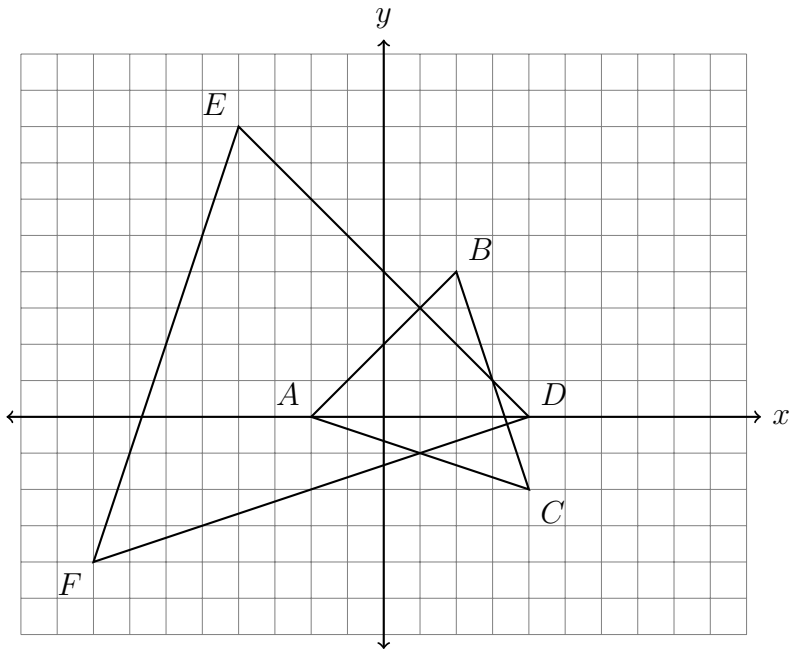
27. Of two supplementary angles, the measure of $\angle A$ is five times that of $\angle B$. Find $m\angle A$.

28. On the set of axes below, $\triangle ABC$ has vertices at $A(-2, 0)$, $B(2, 4)$, $C(4, -2)$, and $\triangle DEF$ has vertices at $D(4, 0)$, $E(-4, 8)$, $F(-8, -4)$.



Which tranformations map $\triangle ABC \to \triangle DEF$? Mark each statement True or False

(a) A dilation with a scale factor of -2 centered at the origin True False

(b) A dilation with a scale factor of $\frac{1}{2}$ centered at point A True False

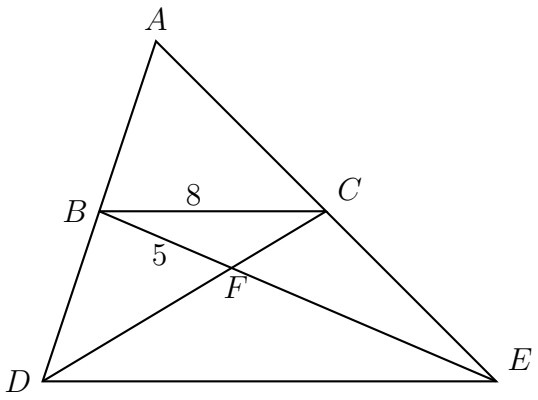
(c) A dilation with a scale factor of 2 centered at the origin, followed by a rotation of 180° about the origin True False

(d) A dilation with a scale factor of 2 centered at the origin, followed by a reflection across the y-axis True False

29. 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 $BC = 8$ and $BF = 5$.

    Find DE and FE.



30. In $\triangle ABC$ shown below, side $\overline{AC}$ is extended to point D with $m\angle DAB = (11x + 12)°$, $m\angle C = (3x + 3)°$, and $m\angle B = (9x + 2)°$.

    What is $m\angle BAC$?