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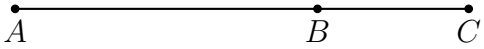
2.12 Test: Applying triangle theorems

1. Apply the Segment Addition postulate. Given $\overline{ABC}$ with $AB = 11\frac{1}{2}$ and $BC = 6\frac{1}{4}$. Find AC.

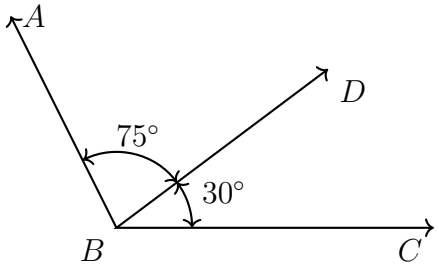


2. Apply the Angle Addition postulate. Write and equation to support your work.

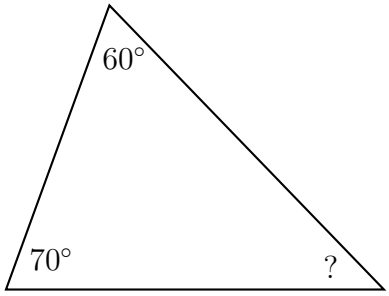
   Given $\text{m}\angle ABD = 75°$ and

   $\text{m}\angle DBC = 30°$.

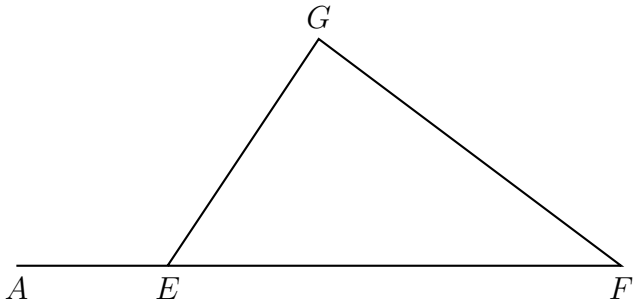
   Find $m\angle ABC$.



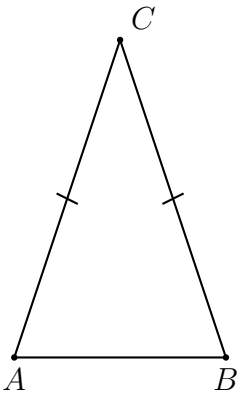
3. A triangle has two angles measuring 70° and 60° respectively. Find the measure of the third angle.



4. Given $\triangle EFG$ with $\overline{EF}$ extended to A. If $m\angle F = 44°$ and $m\angle G = 92°$, find $m\angle AEG$.



5. Given $\triangle ABC$. $\overline{AC} \cong \overline{BC}$, $\text{m}\angle A = 60$. Find $\text{m}\angle C$.



6. The measures in degrees of the three angles of a triangle are x, $\frac{1}{2}x$, and $\frac{3}{2}x$. Find the measures of the triangle's angles.

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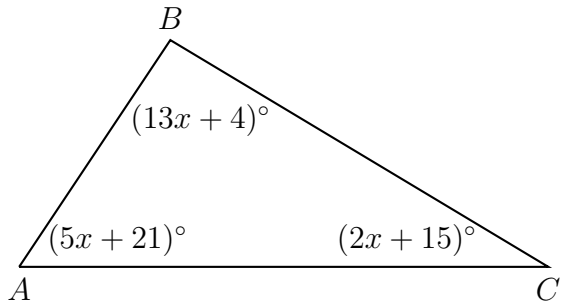
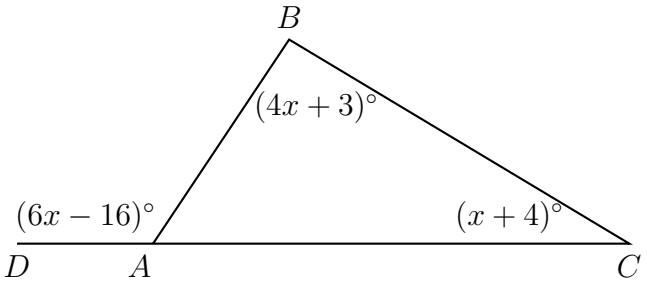
7. In $\triangle ABC$ shown below, $m\angle A = (5x+21)°$, $m\angle B = (13x+4)°$, and $m\angle C = (2x+15)°$.

   What is $m\angle A$?



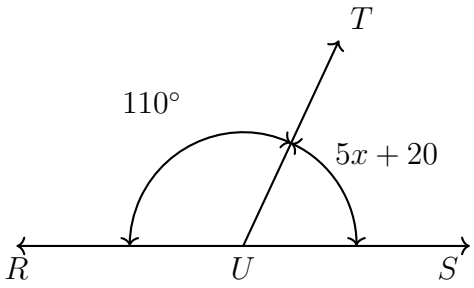
8. In $\triangle ABC$ shown below, side $\overline{AC}$ is extended to point D with $m\angle DAB = (6x - 16)°$, $m\angle C = (x + 4)°$, and $m\angle B = (4x + 3)°$.

   Find $m\angle BAC$.

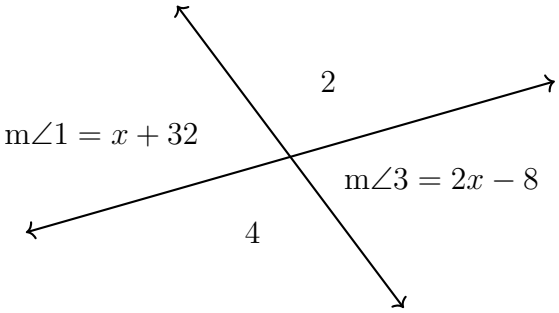


9. A linear pair is formed by two angles, $\text{m}\angle RUT = 110°$ and $\text{m}\angle SUT = 5x + 20$.

   Write an equation, then solve for x.



10. As shown below, two lines intersect making four angles: $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$. Given that $\text{m}\angle 1 = x + 32$ and $\text{m}\angle 3 = 2x - 8$, find $\text{m}\angle 1$.



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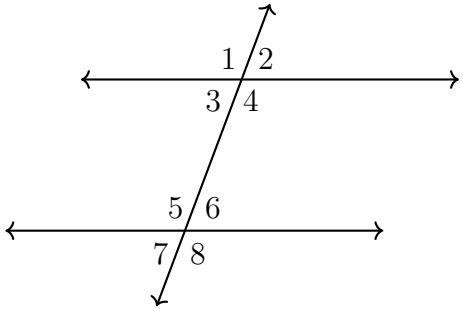
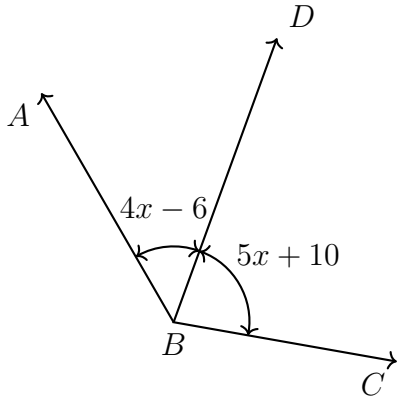
11. Given two parallel lines and a transversal, with $\text{m}\angle 1 = 3x - 10$ and $\text{m}\angle 8 = 2x + 32$. Write an equation, then solve for x.

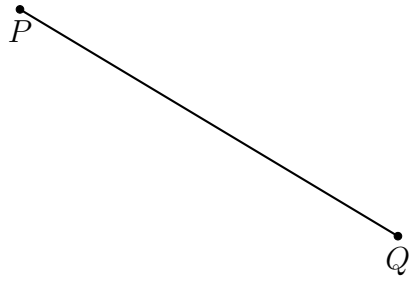


12. Given $\text{m}\angle ABD = 4x - 6$, $\text{m}\angle DBC = 5x + 10$, and $m\angle ABC = 130°$, as shown.

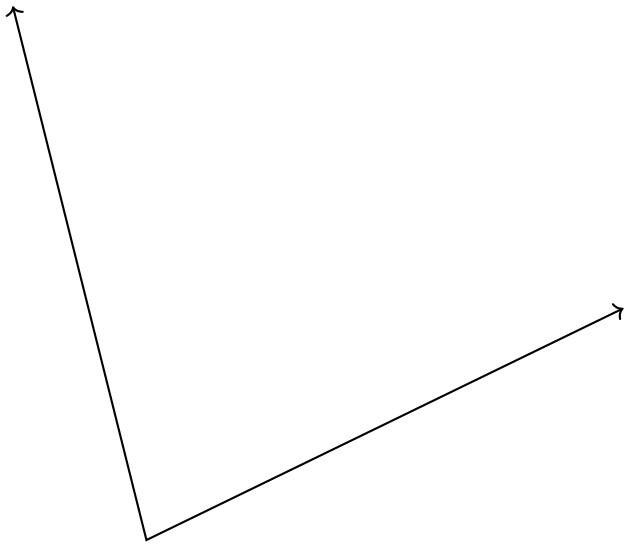
    Model the situation with an equation, then solve for x. Check your solution for full credit.



13. Construct a perpendicular bisector of $\overline{PQ}$.



14. Construct an angle bisector of the given angle.



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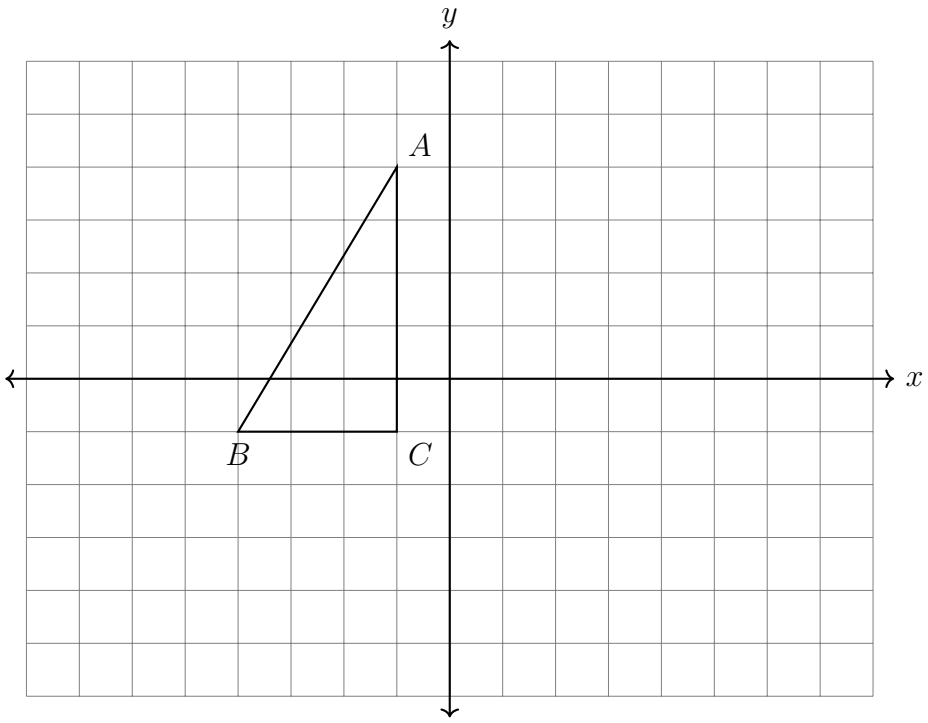
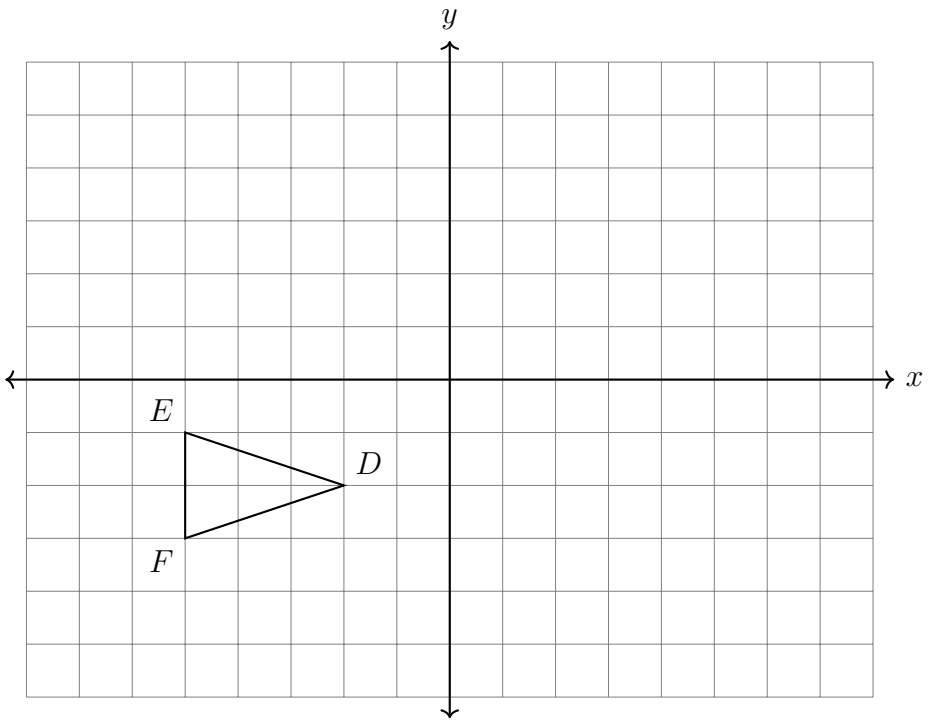
15. Reflect $\triangle ABC$ across the y-axis. Label the image $\triangle A'B'C'$.



16. Perform the translation $x \to x + 4, y \to y + 6$ on $\triangle DEF$. Label the image $\triangle D'E'F'$.

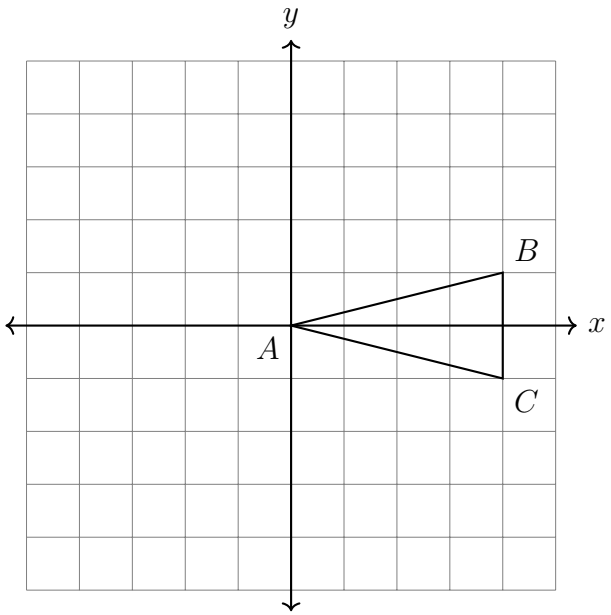


17. Rotate the triangle 180° counterclockwise around the origin, $\triangle ABC \rightarrow \triangle A'B'C'$. Complete the table of the coordinates and plot and label the image on the grid.

$A(0,0) \rightarrow$

$B(4,1) \rightarrow$

$C(4,-1) \rightarrow$



18. A translation is applied to $\triangle ABC$ moving it up 3 and to the left 2.

(a) Write as coordinate pairs the vertices of the image, $\triangle A'B'C'$

$A(5,2) \rightarrow$

$B(7,-2) \rightarrow$

$C(11,5) \rightarrow$

(b) Which triangle is larger, or are they the same size? Justify your answer.