

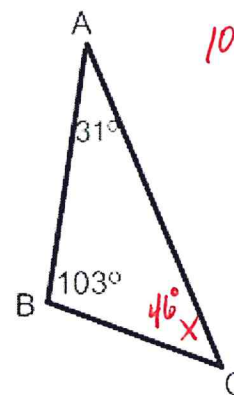
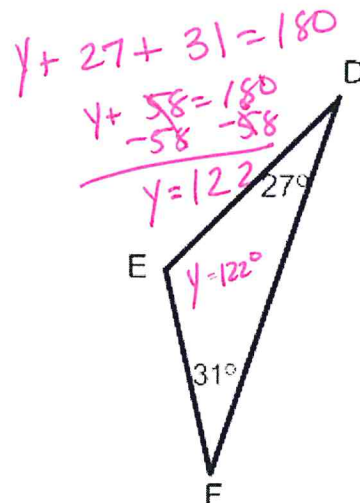
1. Which statement is true?

~~A. $\triangle ABC \sim \triangle DEF$~~

~~B. $m\angle B = m\angle E = 103^\circ$~~

~~C. $m\angle D = m\angle C = 27^\circ$~~

D. $\triangle ABC$ is not similar to $\triangle DEF$

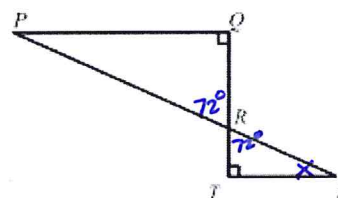


Handwritten work for Triangle ABC:
 $103 + 31 + x = 180$
 $134 + x = 180$
 $-134 \quad -134$
 $x = 46$

2. In the figure shown, $PQ = 12$ centimeters, $ST = 6$ centimeters and $m\angle QRP = 72^\circ$. Find $m\angle S$.

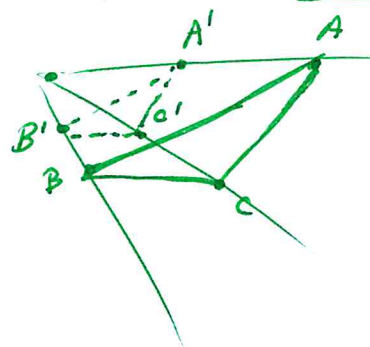
- 1) 72°
- 3) 108°

- 2) 36°
- 4) 18°



Handwritten work for Question 2:
 $x + 72 + 90 = 180$
 $x + 162 = 180$
 $-162 \quad -162$
 $x = 18^\circ$

3. If a figure is dilated from center O by a scale factor $r = \frac{1}{2}$, would the scale factor push or pull away the image from the center?



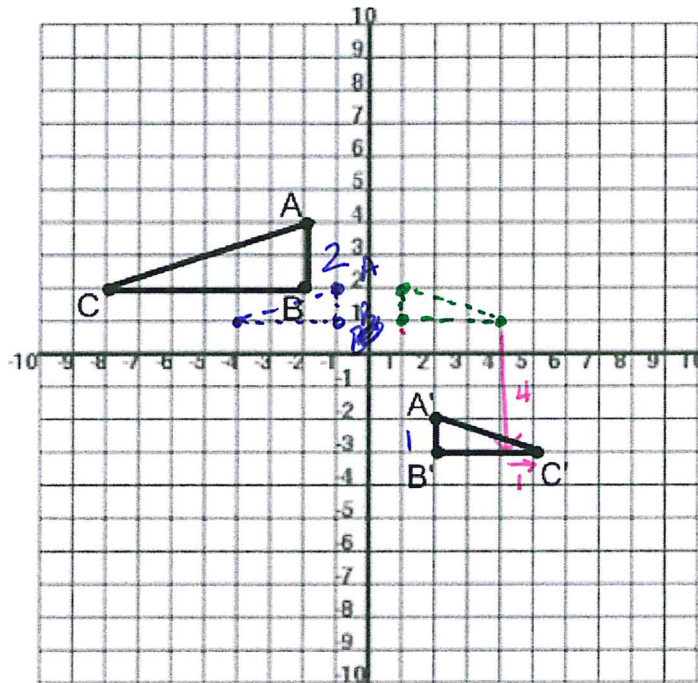
It would pull toward the center.

4. Find the image of $(5, 10)$ for a dilation centered at the origin with a scale factor $\frac{4}{5}$.

Handwritten work for Question 4:
 $(5, 10) \rightarrow (5 \cdot \frac{4}{5}, 10 \cdot \frac{4}{5}) \rightarrow (4, 8)$

5. What sequence of transformations maps $\triangle ABC$ onto $\triangle A'B'C'$?

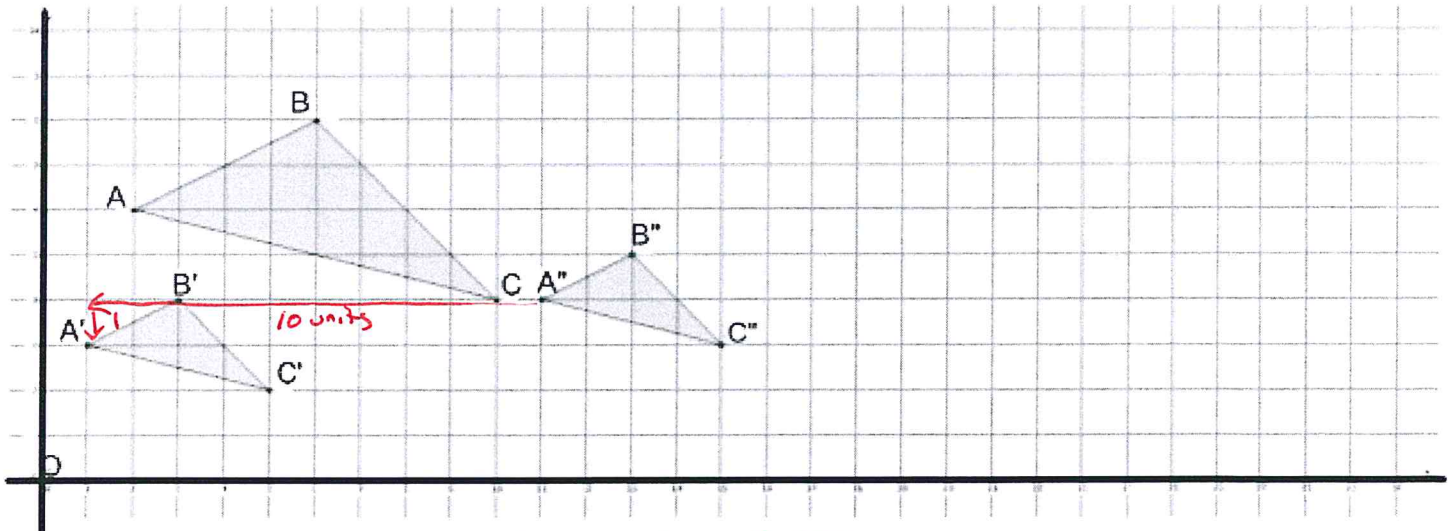
Scale Factor
 $\frac{|A'B'|}{|AB|} = \frac{1}{2}$



Dilate $\triangle ABC$ with a scale factor of $r = \frac{1}{2}$ centered at the origin. Then reflect the dilated triangle over the y -axis followed by a translation of 4 units down and 1 unit right.

6. In the picture below we have a triangle ABC , that has been dilated from center O , by a scale factor of $r = \frac{1}{2}$. It is noted by $A'B'C'$. We also have triangle $A''B''C''$, which is congruent to triangle $A'B'C'$ (i.e., $\triangle A'B'C' \cong \triangle A''B''C''$).

Describe the sequence that would map triangle $A''B''C''$ onto triangle ABC .



First Step: Find scale factor.

Second Step: Find rigid motion.

Third Step: Use precise language to describe the sequence.

$r = \frac{1}{2} \leftarrow \text{reciprocal}$ $\frac{2}{7}$

Translate $\triangle A''B''C''$ left 10 units and down 1 unit onto $\triangle A'B'C'$. Then, dilate $\triangle A'B'C'$ with a scale factor of $r = 2$ centered at the point $(0, 0)$.

7. A line crosses the y-axis at (0, -2) and rises 3 units up for every 2 units it moves left. Which one represents the equation of the line? (choose one)

a) $y = 3x + 2$

b) $y = \frac{3}{-2}x - 2$

c) $y = \frac{3}{-2}x + 2$

d) $y = -2x - 2$

slope $\uparrow 3$
 $\leftarrow 2$ $-\frac{3}{2}$
 $b = (0, -2)$

8. Which ordered pair satisfies the system of equations below?

$$\begin{array}{r} 3x - y = 8 \\ x + y = 2 \\ \hline 4x = 10 \\ \hline x = 2.5 \end{array}$$

$$\begin{array}{r} x + y = 2 \\ 2.5 + y = 2 \\ -2.5 \quad -2.5 \\ \hline y = -0.5 \end{array}$$

- (A) (3, -1) (B) (2.5, 0.5) (C) (2.5, -0.5) (D) (5, -3)

9. How many solutions does a system have if the lines are parallel?

- (A) 0 (B) 1 (C) 2 (D) infinite

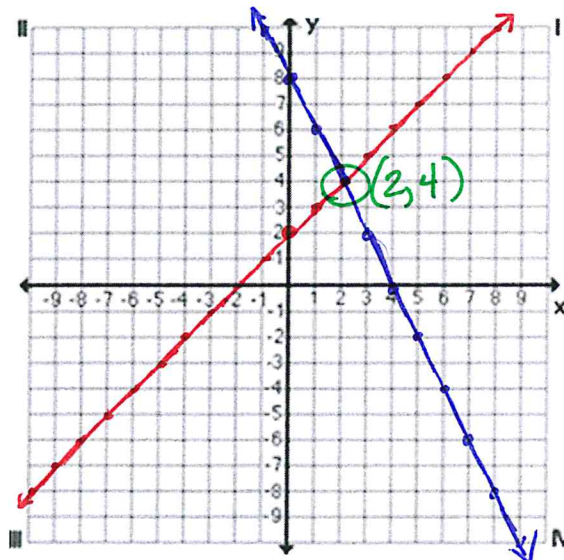
10. Solve the following systems graphically

$$\begin{array}{r} 2x + y = 8 \\ -2x \quad -2x \\ \hline y = -2x + 8 \end{array}$$

$m = -\frac{2}{1} \downarrow 2$
 $\frac{1}{1} \rightarrow 1$
 $b = 8$

$$\begin{array}{r} y - x = 2 \\ +x \quad +x \\ \hline y = x + 2 \end{array}$$

$m = \frac{1}{1} \uparrow 1$
 $\frac{1}{1} \rightarrow 1$
 $b = 2$



$4 - 2 = 2$
 $2 = 2$
 $2(2) + 4 = 8$
 $4 + 4 = 8$
 $8 = 8$

Solve the systems algebraically

11. $8a + 5b = 9$
 $2a - 5b = -4$

$$\begin{array}{r} 10a = 5 \\ \hline 10 \quad 10 \\ \hline a = \frac{1}{2} \end{array}$$

$2(\frac{1}{2}) - 5b = -4$ $(\frac{1}{2}, 1)$

$$\begin{array}{r} -5b = -4 \\ \hline -1 \quad -1 \\ \hline -5b = -5 \quad b = 1 \end{array}$$

12. $y = -2x - 4$
 $-6x + 3y = -12$

$$\begin{array}{r} -6x + 3(-2x - 4) = -12 \\ -6x - 6x - 12 = -12 \\ -12x - 12 = -12 \\ \hline +12 \quad +12 \\ \hline -12x = 0 \quad (0, -4) \\ \hline -12 \quad -12 \\ \hline x = 0 \end{array}$$

$y = -2(0) - 4$
 $y = -4$

13. $x - 2y = 16$
 $y = 2x + 1$

$$\begin{array}{r} x - 2(2x + 1) = 16 \\ x - 4x - 2 = 16 \\ -3x - 2 = 16 \\ \hline +2 \quad +2 \\ \hline -3x = 18 \\ \hline -3 \quad -3 \\ \hline x = -6 \end{array}$$

$y = 2(-6) + 1$
 $y = -12 + 1$ $(-6, -11)$
 $y = -11$

14. At the Savemore Supermarket, 3 pounds of squash and 2 pounds of eggplant cost \$2.85. The cost of 4 pounds of squash and 5 pounds of eggplant is \$5.41. What is the cost of one pound of squash, and what is the cost of one pound of eggplant?

let $x =$ cost of 1lb. of squash
 let $y =$ cost of 1lb. of eggplant

$$\begin{array}{r} 5(3x + 2y = 2.85) \\ -2(4x + 5y = 5.41) \end{array} \Rightarrow \begin{array}{r} 15x + 10y = 14.25 \\ \hline -8x - 10y = -10.82 \end{array}$$

$$\begin{array}{r} \cancel{15x} + \cancel{10y} = 3.43 \\ \hline -7 \\ \hline x = 0.49 \end{array}$$

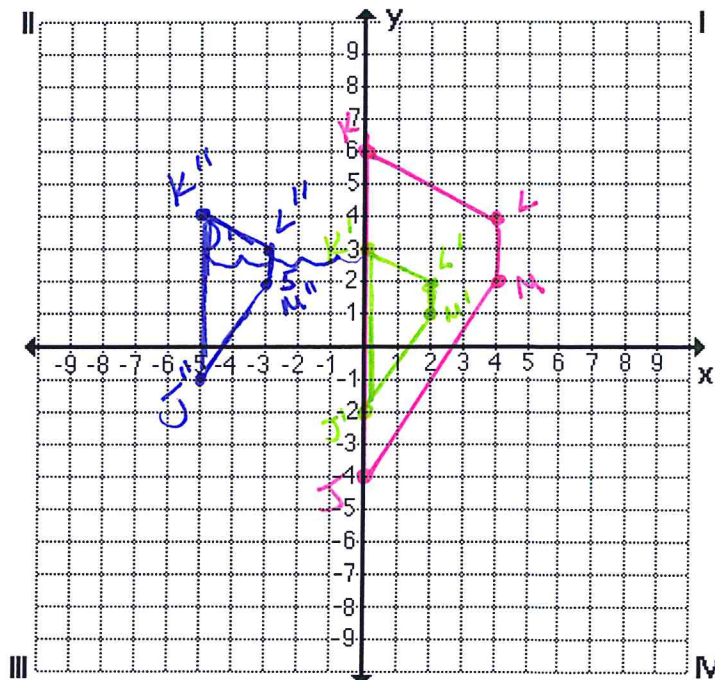
$$\begin{array}{r} 3(0.49) + 2y = 2.85 \\ 1.47 + 2y = 2.85 \\ \hline -1.47 \quad -1.47 \\ \hline 2y = 1.38 \quad y = 0.69 \end{array}$$

The cost of 1lb. of squash is \$0.49 and the cost of 1lb. of eggplant is \$0.69

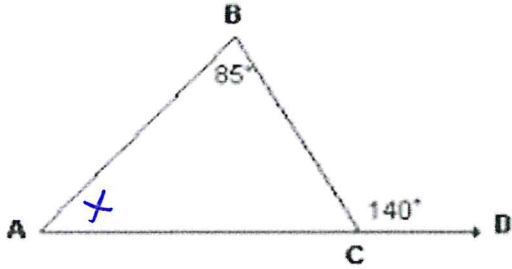
15. Given the figure JKLM with vertices J(0,-4) K(0,6) L(4,4) and M(4,2) graph the image J'K'L'M' after a dilation with a scale factor of 1/2. Then, using J'K'L'M' as your new preimage, translate J'K'L'M' 5 units left and 1 unit up and label the new figure J''K''L''M''.

Dilate

$$\begin{array}{l} J(0, -4) \rightarrow (0 \cdot \frac{1}{2}, -4 \cdot \frac{1}{2}) = J'(0, -2) \\ K(0, 6) \rightarrow (0 \cdot \frac{1}{2}, 6 \cdot \frac{1}{2}) = K'(0, 3) \\ L(4, 4) \rightarrow (4 \cdot \frac{1}{2}, 4 \cdot \frac{1}{2}) = L'(2, 2) \\ M(4, 2) \rightarrow (4 \cdot \frac{1}{2}, 2 \cdot \frac{1}{2}) = M'(2, 1) \end{array}$$



16. In the diagram of $\triangle ABC$, line segment \overline{AC} is extended to D, $m\angle BCD = 140^\circ$ and $m\angle ABC = 85^\circ$. Find $m\angle BAC$.



A. 15°

C. 180°

B. 55°

D. 235°

$$\begin{array}{r} x + 85 = 140 \\ -85 \quad -85 \\ \hline x = 55^\circ \end{array}$$

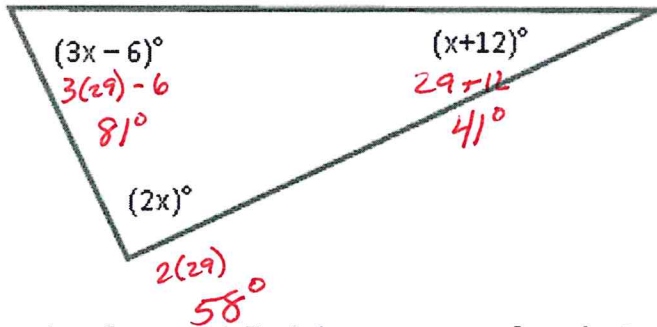
17. Dakota drew a triangle in the coordinate plane and applied 3 transformations.

- First, she reflected the triangle over the y-axis
- Then she rotated the resulting image 90° about the origin
- Finally, she translated the third triangle up 3 units

Which statement correctly describes the effect of this sequence of transformations on the original triangle?

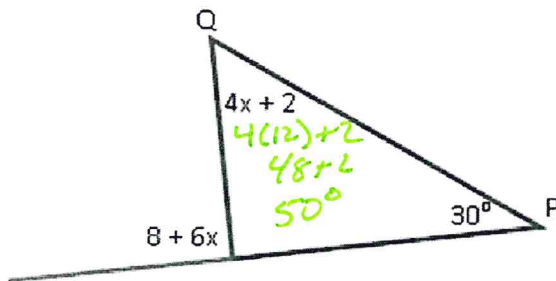
- A. Only the angle measures changed
- B. Only the side lengths changed
- C. Neither the angle measures nor side lengths changed**
- D. Both the angle measures and side lengths changed

18. Solve for x and fill in all angles. Diagram is not drawn to scale.



$$\begin{array}{r} 3x - 6 + x + 12 + 2x = 180 \\ 6x + 6 = 180 \\ -6 \quad -6 \\ \hline 6x = 174 \\ \frac{6x}{6} = \frac{174}{6} \\ x = 29 \end{array}$$

19. Solve for x and find the measure of angle Q.



$$\begin{array}{r} 4x + 2 + 30 = 8 + 6x \\ 4x + 32 = 8 + 6x \\ -4x \quad -4x \\ \hline 32 = 8 + 2x \\ -8 \quad -8 \\ \hline 24 = 2x \\ \frac{24}{2} = \frac{2x}{2} \\ 12 = x \end{array}$$

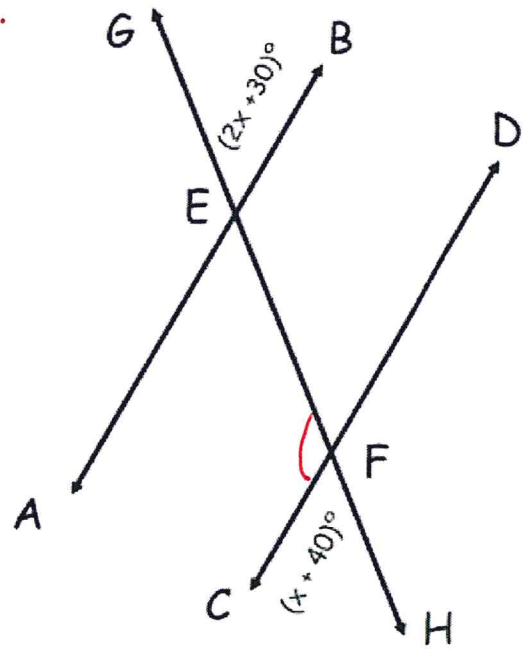
20. Line AB and CD are parallel. Line GH intersects the parallel lines at points E and F.

A) Geometry Fact Alternate Exterior \angle 's.

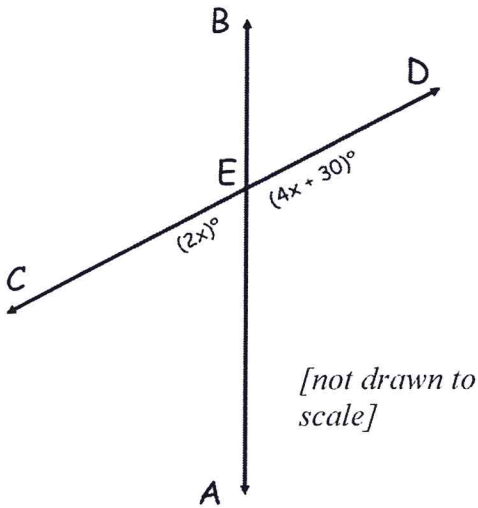
B) Solve for x:
$$\begin{array}{r} 2x + 30 = x + 40 \\ -x \quad -x \\ \hline x + 30 = 40 \\ -30 \quad -30 \\ \hline x = 10 \end{array}$$

C) Solve for $\angle GEB$:
$$\frac{2(10) + 30}{20 + 30} = 50^\circ$$

D) Solve for $\angle CFG$:
$$180 - 50 = 130^\circ$$



21. Line AB intersects line CD at point E.



A.) Geometry Fact Supplementary \angle 's

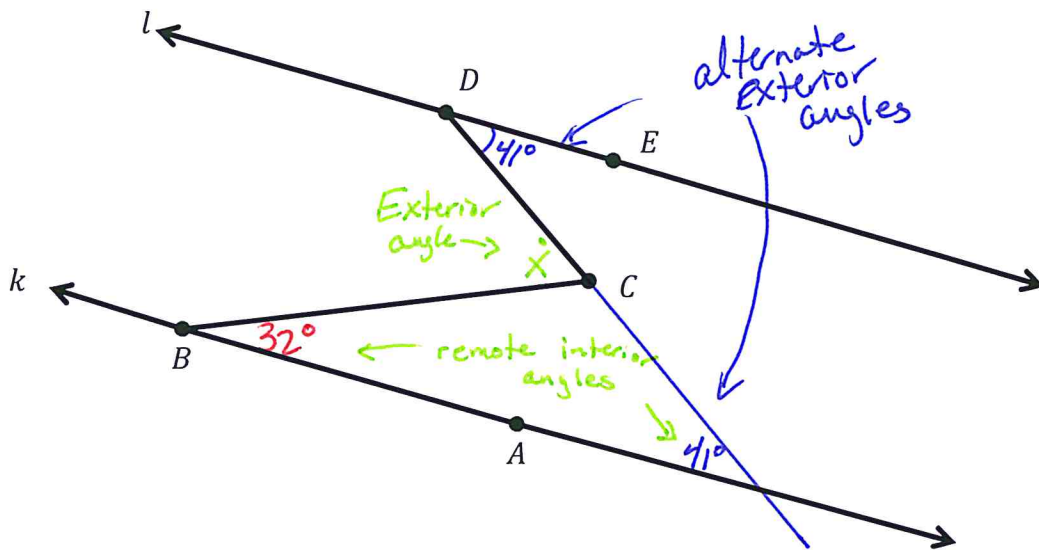
B.) Solve for x:
$$\begin{array}{r} 2x + 4x + 30 = 180 \\ 6x + 30 = 180 \\ -30 \quad -30 \\ \hline 6x = 150 \\ \frac{6x}{6} = \frac{150}{6} \\ x = 25 \end{array}$$

C.) Solve for $\angle AEC$:
$$2(25) = 50^\circ$$

D.) Solve for $\angle AED$:
$$130^\circ$$

22. Use the diagram to answer the question below.

$k \parallel l$



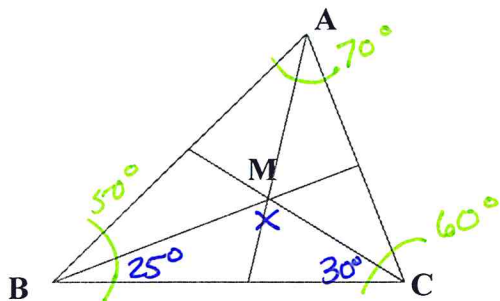
Line k is parallel to line l . $m\angle EDC = 41^\circ$ and $m\angle ABC = 32^\circ$. Find the $m\angle BCD$. Explain in detail how you know you are correct. Add additional lines and points as needed for your explanation.

$$x = 32 + 41$$

$$x = 73^\circ$$

$$m\angle BCD = 73^\circ$$

23. In triangle $\triangle ABC$, point M is the point of intersection of the bisectors of angles BAC , ABC , & ACB . The measure of angle ABC is 50° and the measure of angle BAC is 70° . What is the measure of angle BMC ? Show ALL work!



[not drawn to scale]

$$m\angle BMC = 125^\circ$$

$$70 + 50 + m\angle BCA = 180$$

$$\begin{array}{r} 180 \\ -120 \\ \hline m\angle BCA = 60 \end{array}$$

$$m\angle x + 25 + 30 = 180$$

$$\begin{array}{r} m\angle x + 55 = 180 \\ -55 \quad -55 \\ \hline m\angle x = 125^\circ \end{array}$$