6.12b Exam: Graphing, perpendicular and parallel slopes

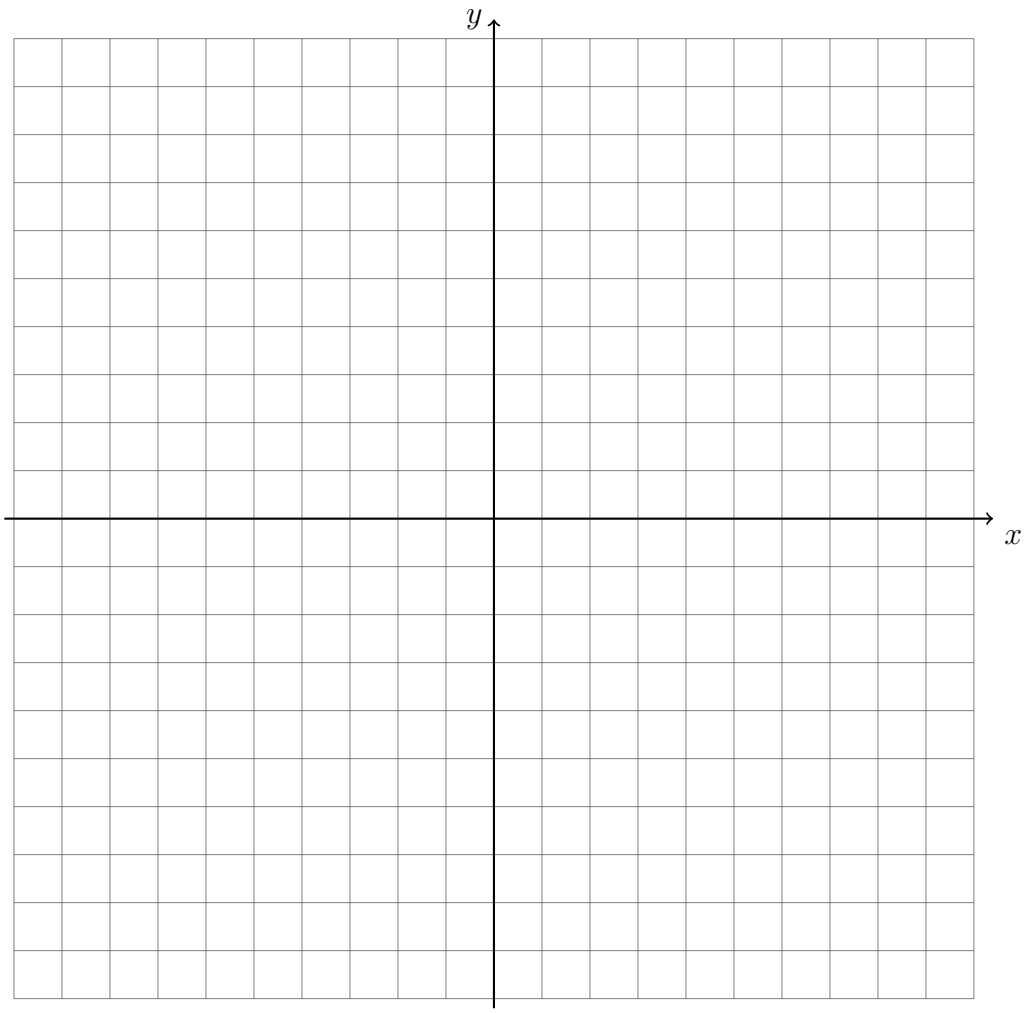
1. Graph and label the two equations. Mark their intersection as an ordered pair.

   $y = \frac{3}{4}x - 5$ $y = -x + 2$

   Write down the slopes of the two lines.

   $m_1 =$ $m_2 =$

   Are the lines parallel, perpendicular, or neither? Justify your answer using the slopes.

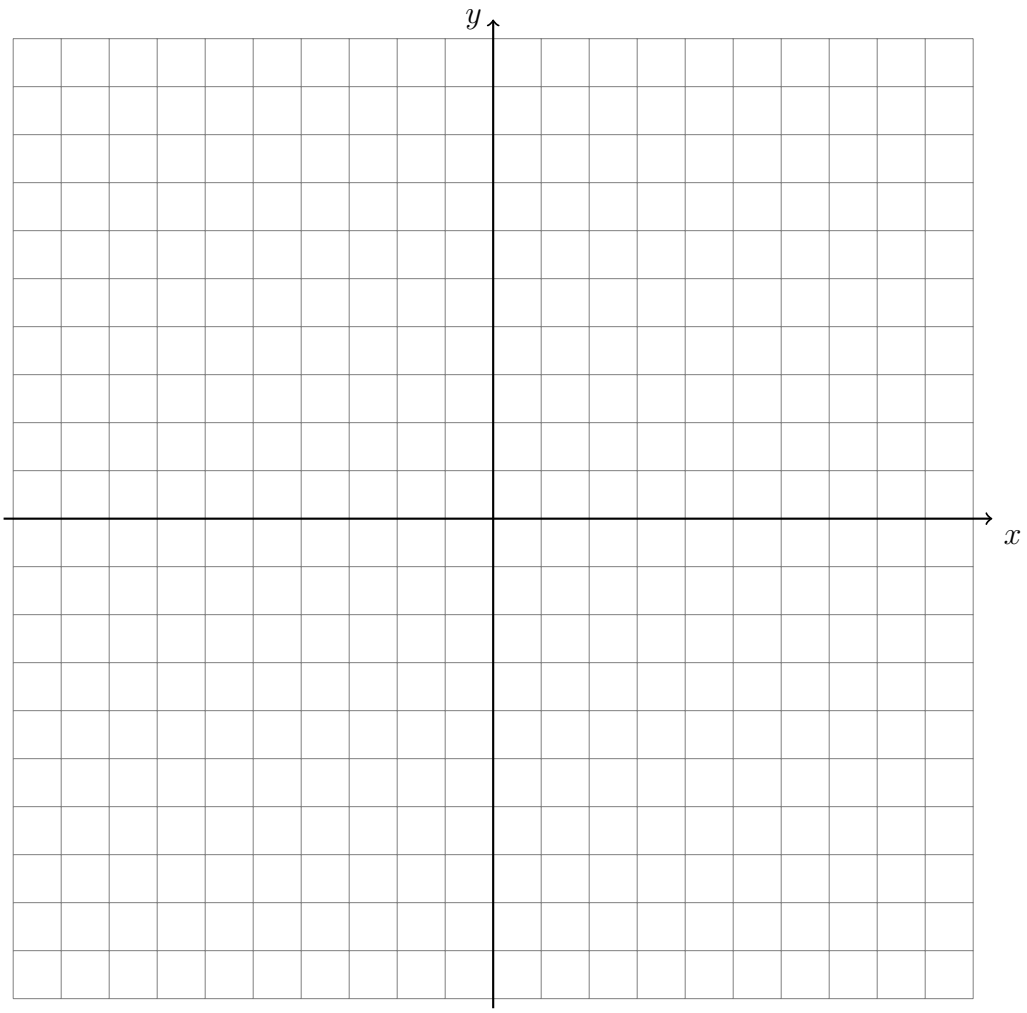


2. Graph and label the two equations. Mark their intersection as an ordered pair.

   $y = -\frac{1}{3}x + 4$

   $y = 3x - 6$

   Are the lines parallel, perpendicular, or neither? Justify your answer using the slopes.

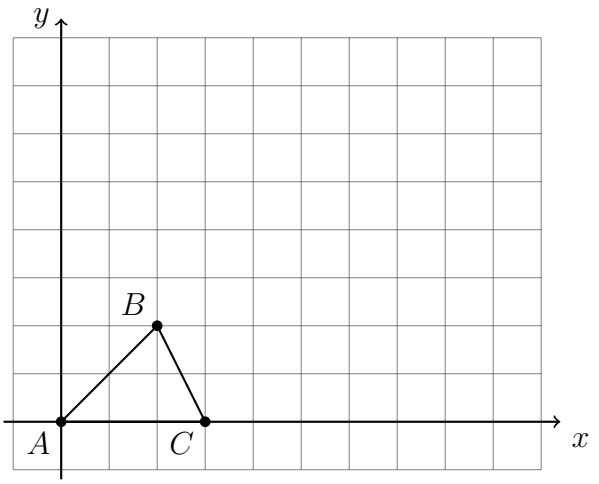


3. The line l has the equation $y = -\frac{3}{5}x + 3$.

   (a) What is the slope of the line k, given $k \parallel l$?

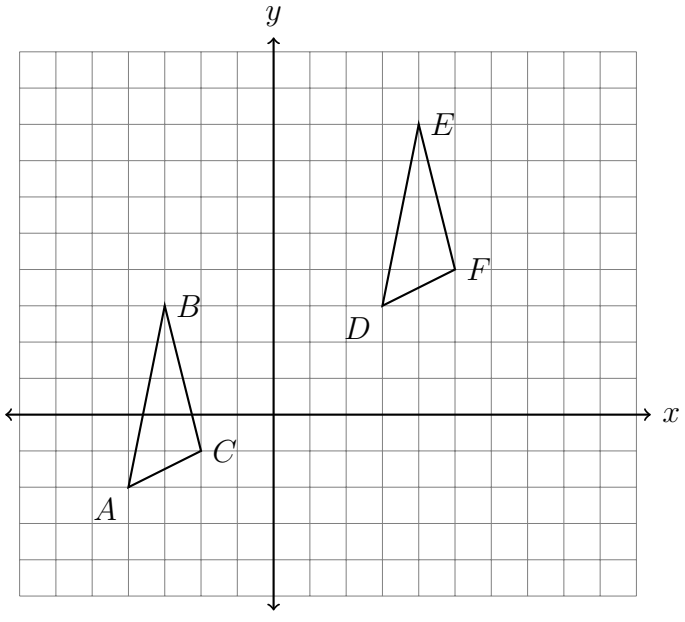
   (b) What is the slope of the line j, given $j \perp l$?

4. Apply a dilation mapping $\triangle ABC \to \triangle A'B'C'$ with a factor of $k = 3$ centered at the origin. Draw and label the image on the grid and make a table of the coordinates.

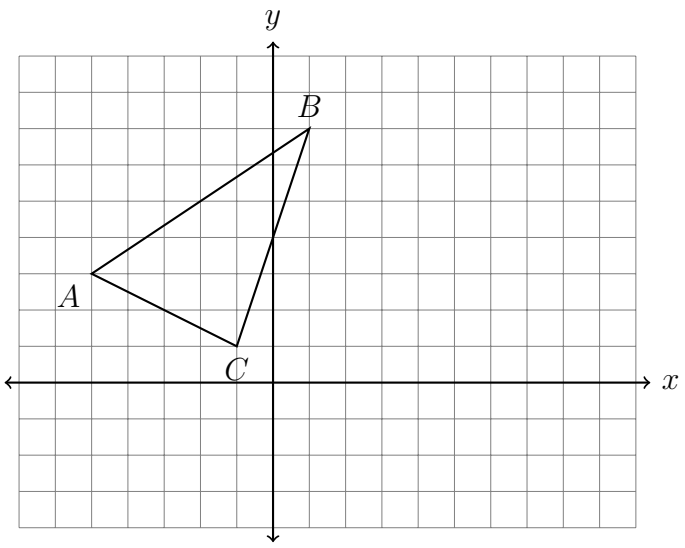


5. Find the image of $P(-2, 7)$ after the translation $(x, y) \to (x + 5, y - 2)$.

6. What transformation maps $\triangle ABC$ onto $\triangle DEF$, shown below? Fully specify the transformation.

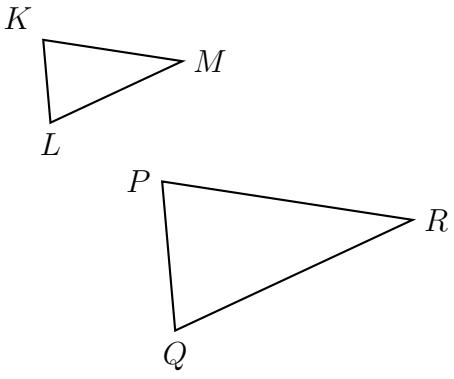


7. Translate $\triangle ABC$ to the right six units and down two units. Make a table of the coordinates and plot and label the image on the axes.



8. A translation maps $P(-5, 3) \to P'(6, 1)$. What is the image of $Q(1, 9)$ under the same translation?

9. A dilation maps triangle KLM onto triangle PQR, with $KM = 5$, $LM = 4$, $PR = 10$.



Complete each mapping or equivalence.

(a) $L \to$ _____

(b) $\angle K \cong$ _____

(c) $QR =$ _____

10. Given $\triangle ABC \sim \triangle DEF$. $m\angle A = 33°$ and $m\angle B = 66°$. Find the measure of $\angle D$.

11. A dilation centered at A maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 6$, $BC = 4$, $AB = 8$, and of $DE = 10$ find the scale factor k and the lengths AD and AE. Then find CE and BD.

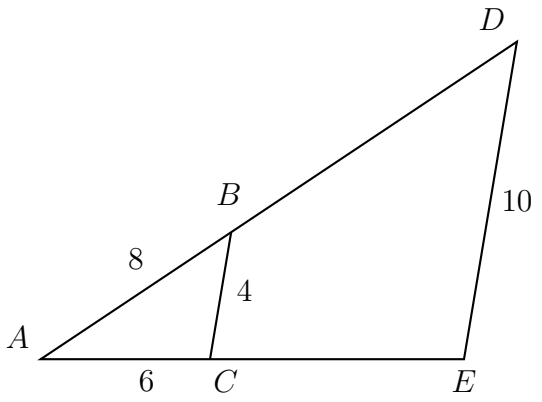
(a) $k =$

(b) $AD =$

(c) $AE =$

(d) $CE =$

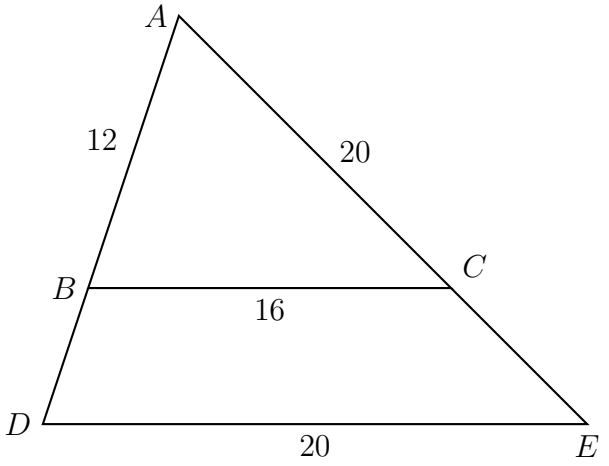
(e) $BD =$



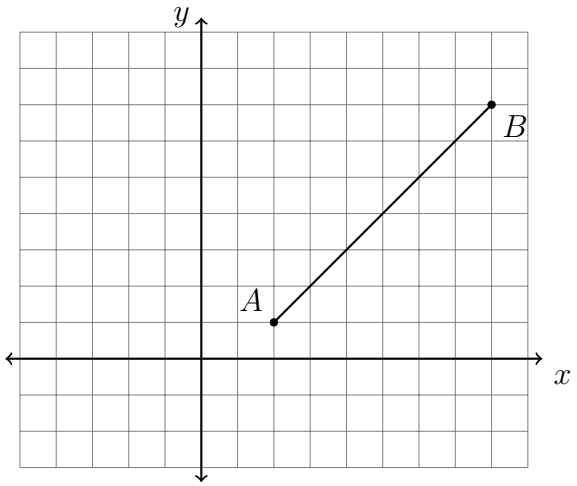
12. Triangle ABC is dilated with a scale factor of k centered at A, yielding $\triangle ADE$, as shown. Given $AB = 12$, $BC = 16$, $AC = 20$, and $DE = 20$.

Find the scale factor k and the segment lengths AD and CE.

(the diagram is not to scale)



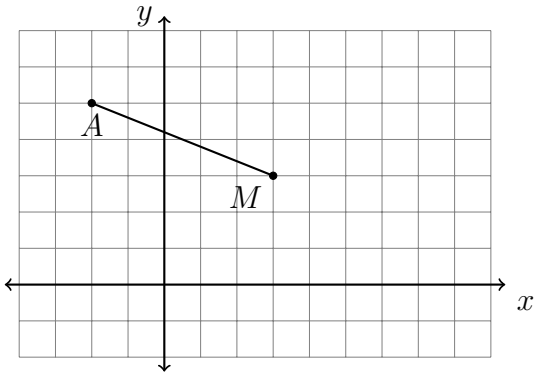
13. As shown, $\overline{AB}$ has endpoints with coordinates $A(2, 1)$ and $B(8, 7)$. Show the calculation for the coordinates of the midpoint M of $\overline{AB}$. Mark and label it on the graph.



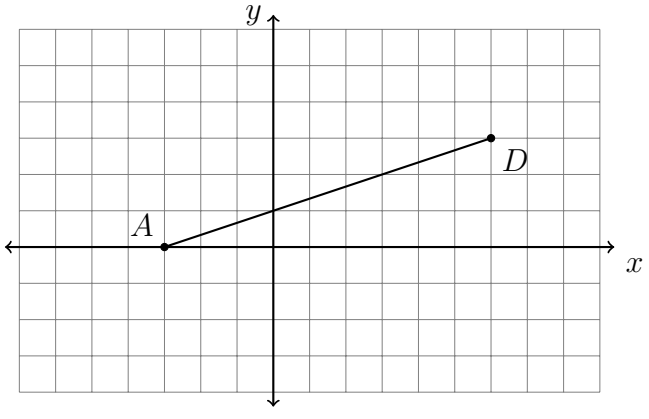
14. $A(-2, 5)$ is one endpoint of $\overline{AB}$. The segment's midpoint is $M(3, 3)$. Find the other endpoint, B, and mark and label it on the graph.

What translation maps

$A(-2, 5) \rightarrow M(3, 3)$?



15. In the diagram below, $\overline{AD}$ has endpoints with coordinates $A(-3, 0)$ and $D(6, 3)$. What points B and C trisect $\overline{AD}$ into three congruent segments? Mark and label them on the graph. State their coordinates.

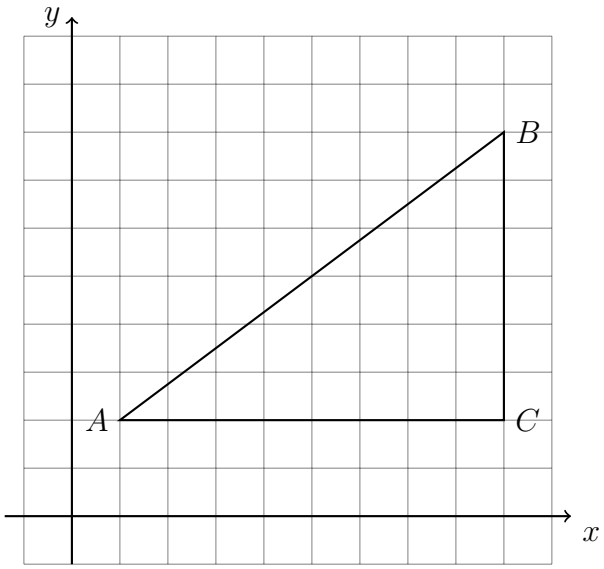


16. Given $\triangle ABC$, find the lengths of its sides. $A(1,2)$, $B(9,8)$, $C(9,2)$.

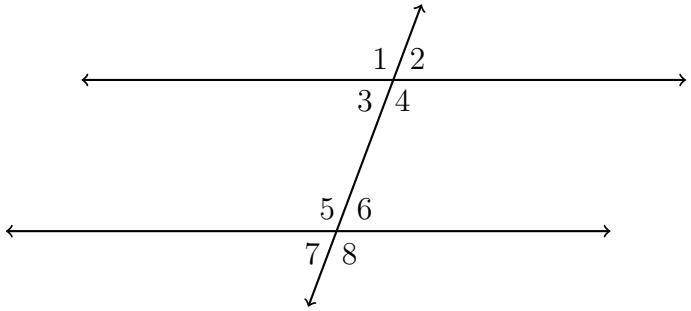
(a) $AC =$

(b) $BC =$

(c) Use the formula for distance:
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
$AB =$



17. Given two parallel lines and a transversal, as shown below. Given $m\angle 1 = 117$.



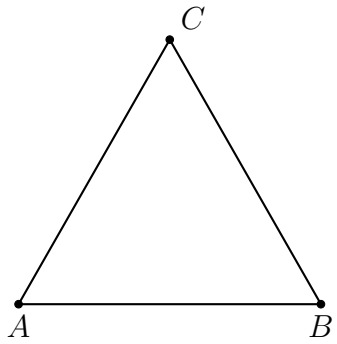
(a) Find the measure $m\angle 2$.

(b) Find the measure $m\angle 4$.

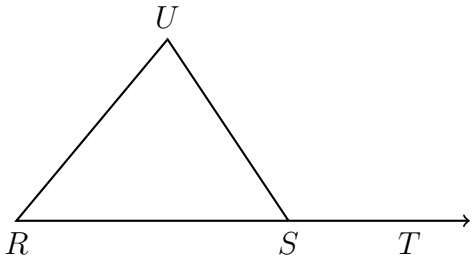
(c) Find the measure $m\angle 5$.

(d) Given $m\angle 8 = (5x - 8)^\circ$. Find x.

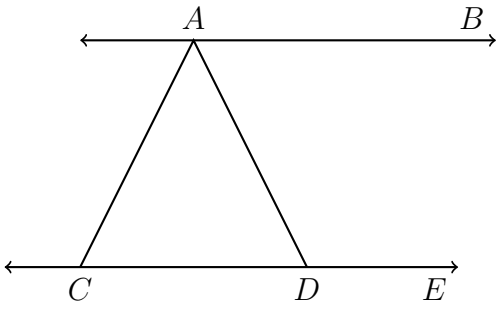
18. Given isosceles $\triangle ABC$ with $\overline{AB} \cong \overline{BC}$, $m\angle A = x$, $m\angle B = 63$, and $m\angle C = y$. Mark and label the diagram, and then find x and y. (*the diagram is not to scale*)



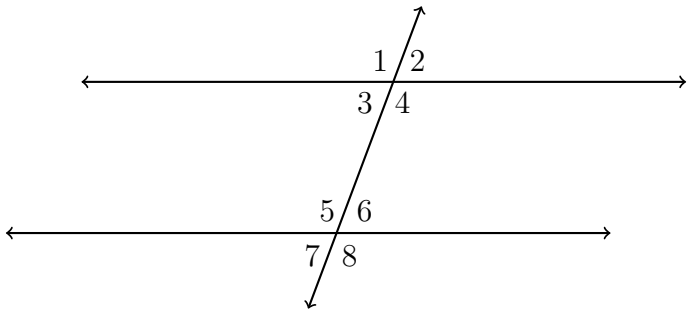
19. Given isosceles $\triangle RSU$ with $\overline{RS} \cong \overline{US}$. If $m\angle UST = 140$ find $m\angle R$. (mark and label the diagram) (*the diagram is not to scale*)



20. Given parallel lines $\overleftrightarrow{AB} \parallel \overleftrightarrow{CDE}$ with $\overline{AC} \cong \overline{CD}$. If $m\angle BAD = 55$ find $m\angle ACD$. (completely mark and label the diagram)



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



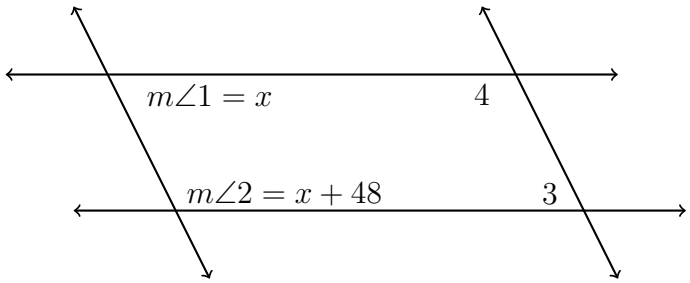
(a) State the angle corresponding with $\angle 7$.

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

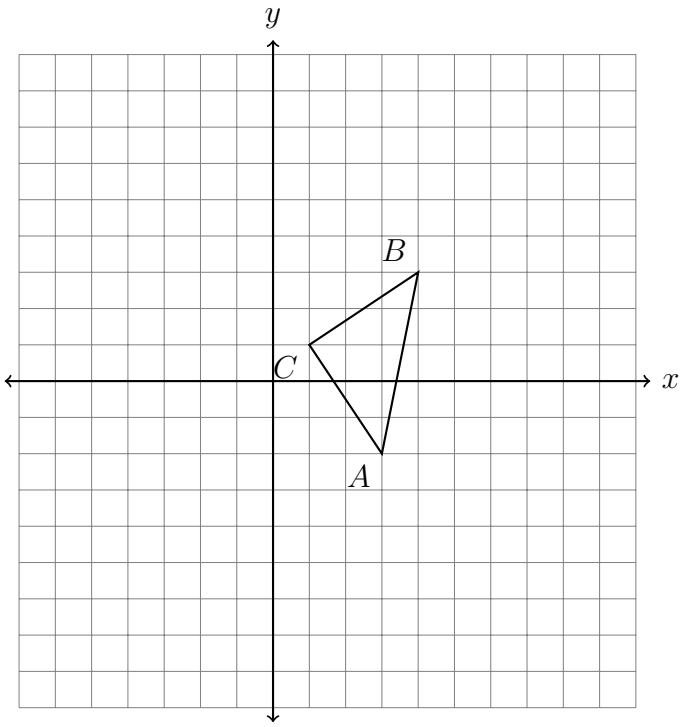
(c) What theorem would justify $\angle 3 \cong \angle 6$? _____

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

22. Two parallel lines intersect a second set of parallel lines. Given $m\angle 1 = x$ and $m\angle 2 = x + 48$, find the measure of $\angle 4$.



23. Translate $\triangle ABC$ by $(x, y) \to (x + 4, y + 2)$ then reflect it over the x-axis. Make a table of the coordinates showing $\triangle ABC \to \triangle A'B'C' \to \triangle A''B''C''$ and plot and label the image on the axes.



24. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 9.6$, $AP = 12.0$, $BP = 6.3$, and $JK = 16.0$. Find JP. (3 stars)