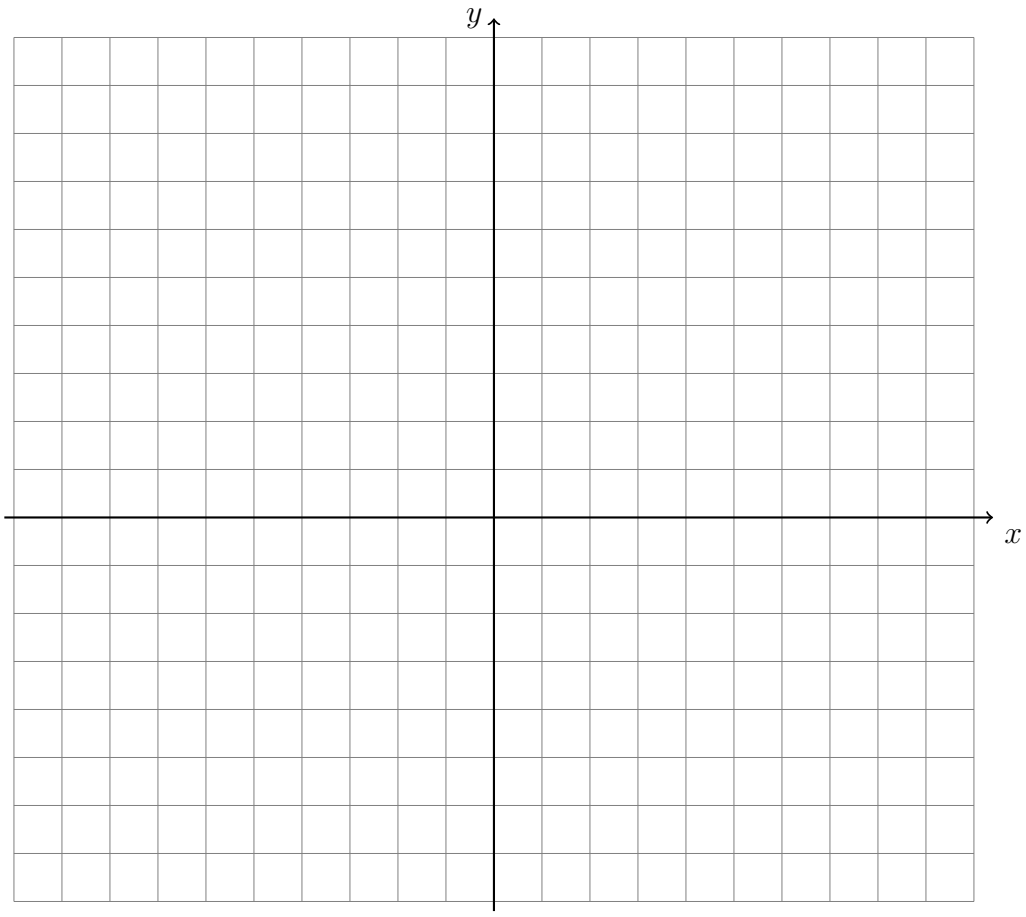
9.7 Linear & quadratic functions on the coordinate plane

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

   $y = -4x - 6$ $x - 3y = -21$

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

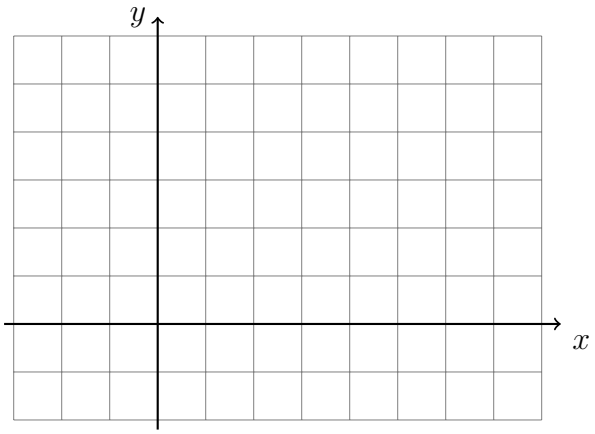


2. The line l has the equation $y = 3x + 2$.

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

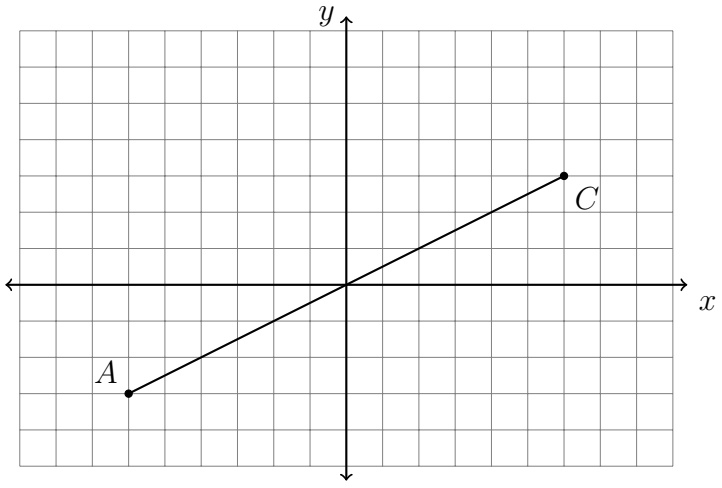
   (b) What is the slope of the line m, given $m \perp l$?

3. On the graph below, draw $\overline{AB}$, with $A(-1, 1)$ and $B(7, 3)$, labeling the end points. Determine and state the coordinates of the midpoint M of $\overline{AB}$ and mark and label it on the graph.

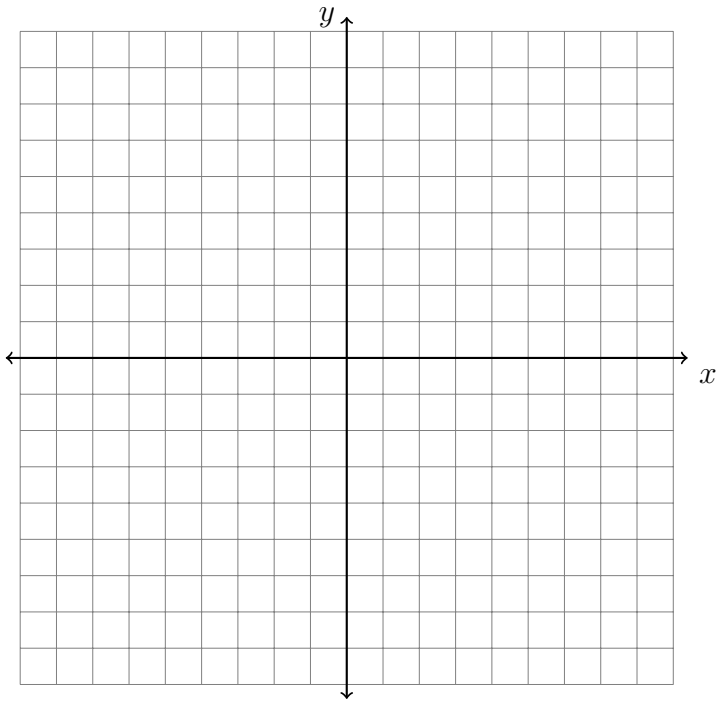


4. $A(-1, 7)$ is one endpoint of $\overline{AB}$. The segment's midpoint is $M(1, 2)$. Find the other endpoint, B.

5. In the diagram below, $\overline{AC}$ has endpoints with coordinates $A(-6, -3)$ and $C(6, 3)$. If B is a point on $\overline{AC}$ and $AB{:}BC = 1{:}3$, what are the coordinates of B?



6. Spicy: On the set of axes below, graph the quadrilateral $ABCD$ having coordinates $A(-3,-3)$, $B(5,1)$, $C(6,8)$, and $D(-2,4)$.



Show that the midpoints of the two diagonals, $\overline{AC}$ and $\overline{BD}$, are the same point.

Prove $ABCD$ is a parallelogram. Use the following theorem: A quadrilateral is a parallelogram if and only if its diagonals bisect each other.

Be sure to state the conclusion in your proof.