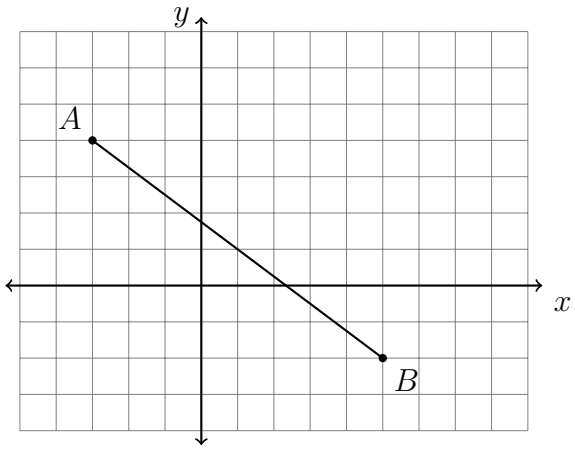
Homework: Linear & quadratic functions on the coordinate plane

1. The line l has the equation $y = -\frac{1}{7}x + 11$.

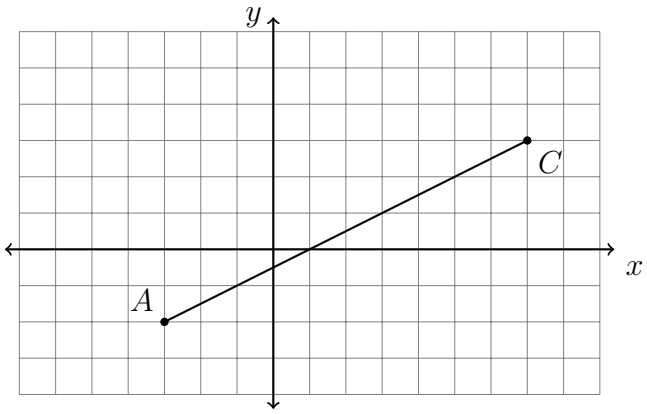
   (a) What is the slope of the line k, given $k \parallel l$?

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

2. In the diagram below, $\overline{AB}$ has endpoints with coordinates $A(-3, 4)$ and $B(5, -2)$. Find the coordinates of the midpoint M of $\overline{AB}$, marking and labeling it on the graph.



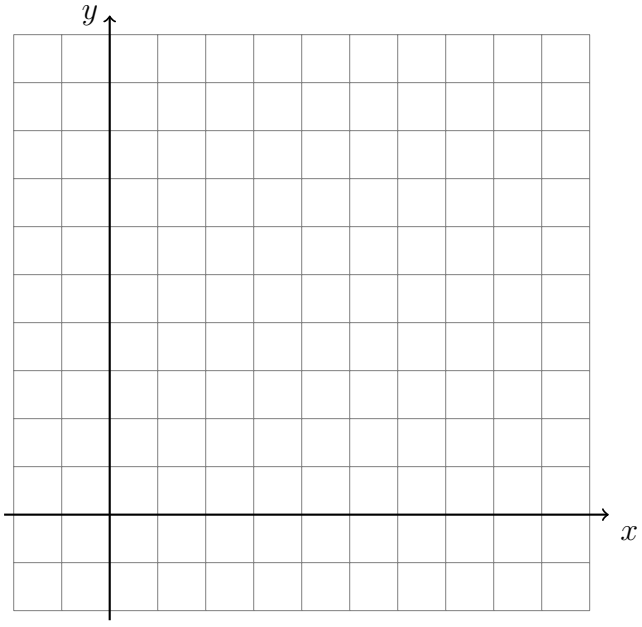
3. In the diagram below, $\overline{AC}$ has endpoints with coordinates $A(-3, -2)$ and $C(7, 3)$. If B is a point on $\overline{AC}$ and $AB{:}BC = 3{:}2$, what are the coordinates of B?



4. Given $P(-2, 7)$ and $Q(3, -5)$, find the length of $\overline{PQ}$.

5. A translation maps $A(-1, 14) \rightarrow A'(-11, 4)$. What is the image of $B(1, -3)$ under the same translation?

6. On the graph, draw polygon ABCDEF with vertices A(1, 1), B(1, 4), C(3, 4), D(3, 7), E(8, 7), and F(8, 1). Find the perimeter and the area of the polygon.



7. Find the decimal value of each expression, rounded to the nearest hundredth.

   (a) $3\sqrt{13}$

   (b) $\dfrac{3^2}{7}$

   (c) $1 - \sqrt{5}$

   (d) $\dfrac{\pi}{4}$

8. In the following two problems, solve for the value of x.

   (a) $\frac{1}{5}(10x + 5) = 3$

   (b) $\frac{2}{3}(5 - x) = -4$

9. Given $f(x) = \frac{1}{3}x + 3$. Solve for x such that for $f(x) = 2$.

10. Given $g(x) = -2x^2 - 5x + 3$. Simplify $g(1)$.

11. Given $h(x) = x^2 - 4x - 5$. Solve $h(x) = 0$.

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

    Find the slope of each of the four sides. What type of quadrilateral is $ABCD$? Justify your answer.