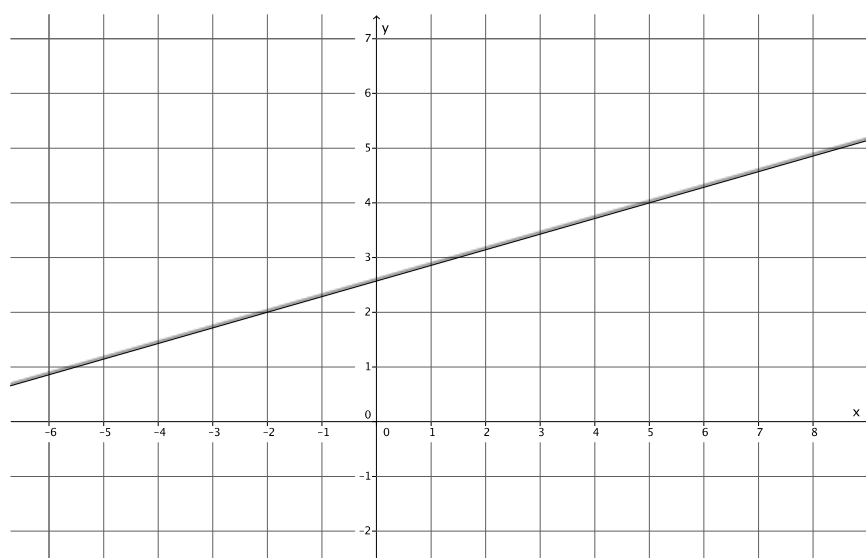


Lesson 21: Some Facts about Graphs of Linear Equations in Two Variables

Classwork

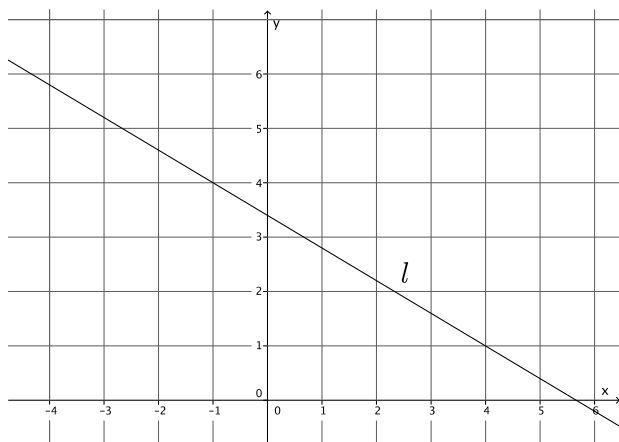
Example 1

Let a line l be given in the coordinate plane. What linear equation is the graph of line l ?



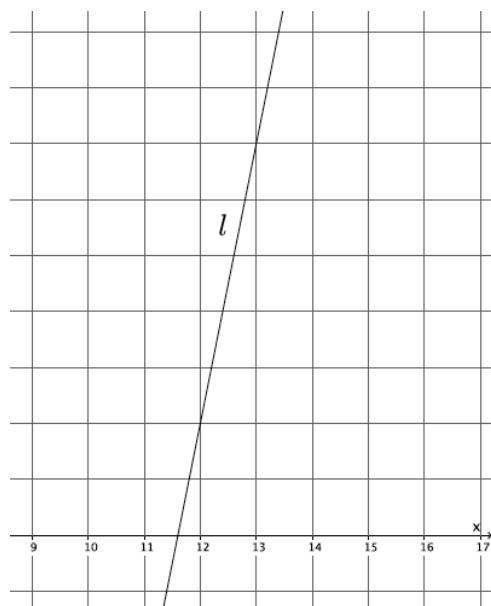
Example 2

Let a line l be given in the coordinate plane. What linear equation is the graph of line l ?

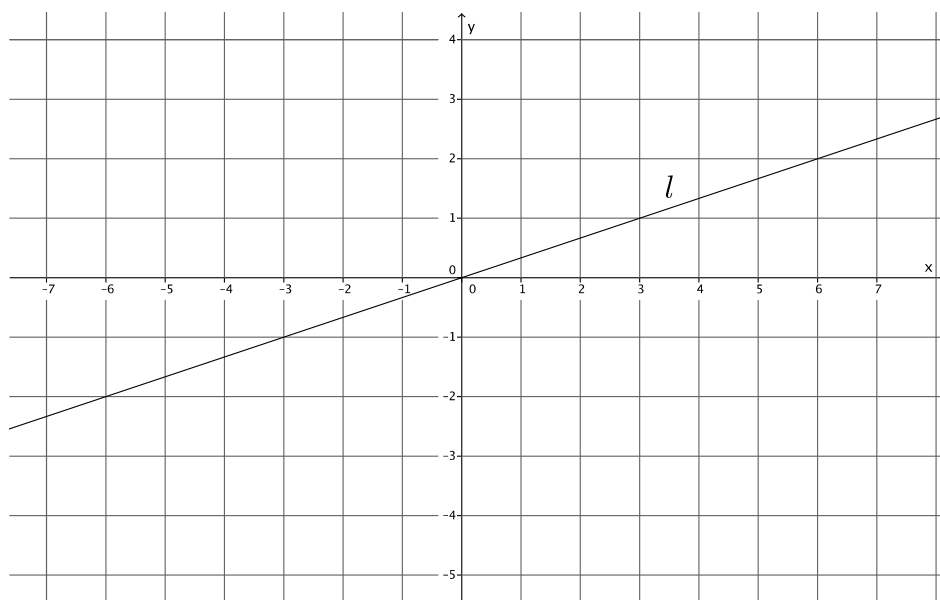


Example 3

Let a line l be given in the coordinate plane. What linear equation is the graph of line l ?

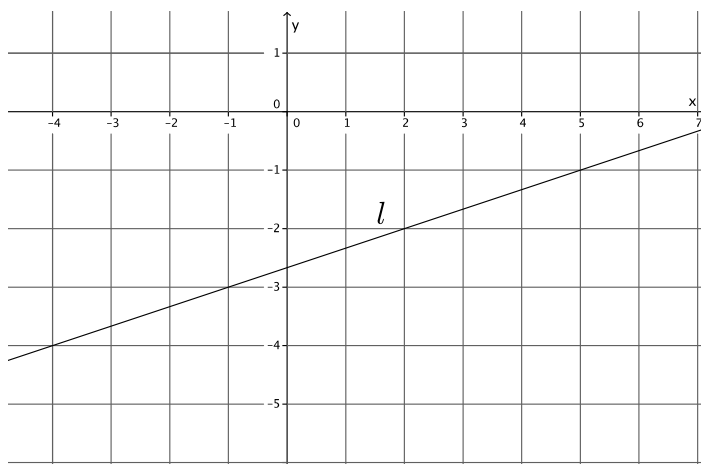
**Example 4**

Let a line l be given in the coordinate plane. What linear equation is the graph of line l ?

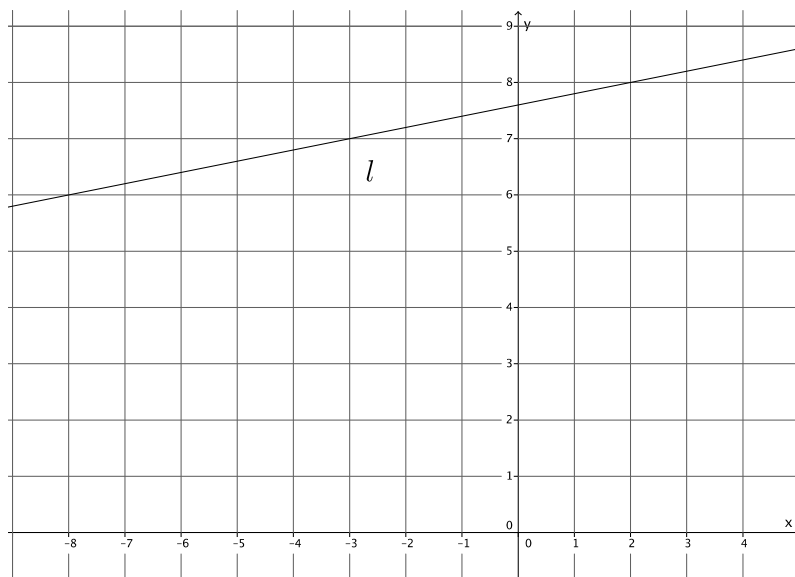


Exercises

1. Write the equation for the line l shown in the figure.

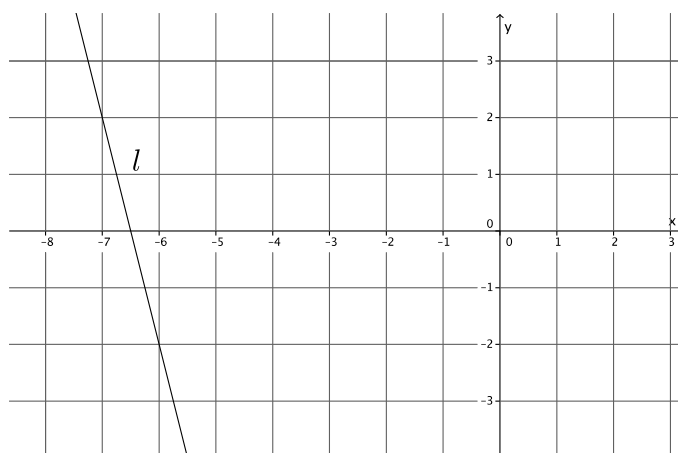


2. Write the equation for the line l shown in the figure.



3. Determine the equation of the line that goes through points $(-4, 5)$ and $(2, 3)$.

4. Write the equation for the line l shown in the figure.



5. A line goes through the point $(8, 3)$ and has slope $m = 4$. Write the equation that represents the line.

Lesson Summary

Let (x_1, y_1) and (x_2, y_2) be the coordinates of two distinct points on a line l . We find the slope of the line by

$$m = \frac{y_2 - y_1}{x_2 - x_1}.$$

This version of the slope formula, using coordinates of x and y instead of p and r , is a commonly accepted version.

As soon as you multiply the slope by the denominator of the fraction above, you get the following equation:

$$m(x_2 - x_1) = y_2 - y_1.$$

This form of an equation is referred to as the point-slope form of a linear equation.

Given a known (x, y) , then the equation is written as

$$m(x - x_1) = (y - y_1).$$

The following is slope-intercept form of a line:

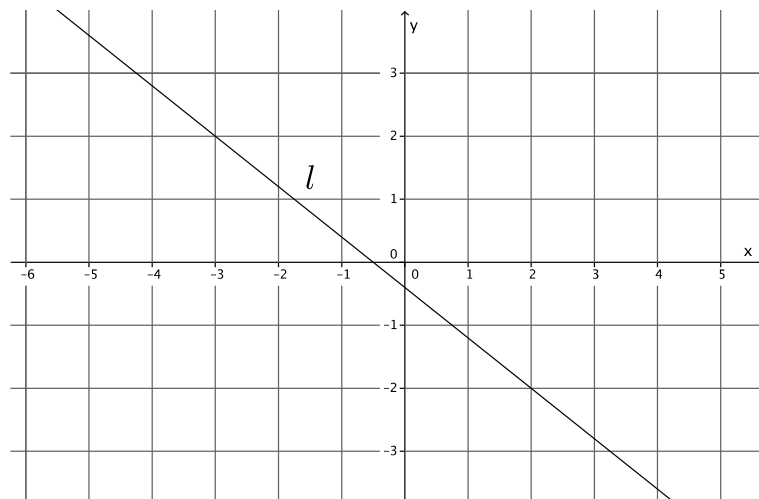
$$y = mx + b.$$

In this equation, m is slope and $(0, b)$ is the y -intercept.

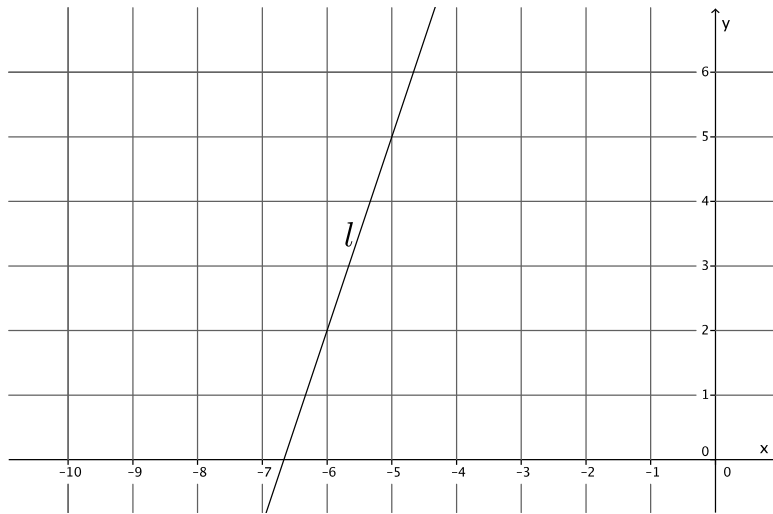
To write the equation of a line you must have two points, one point and slope, or a graph of the line.

Problem Set

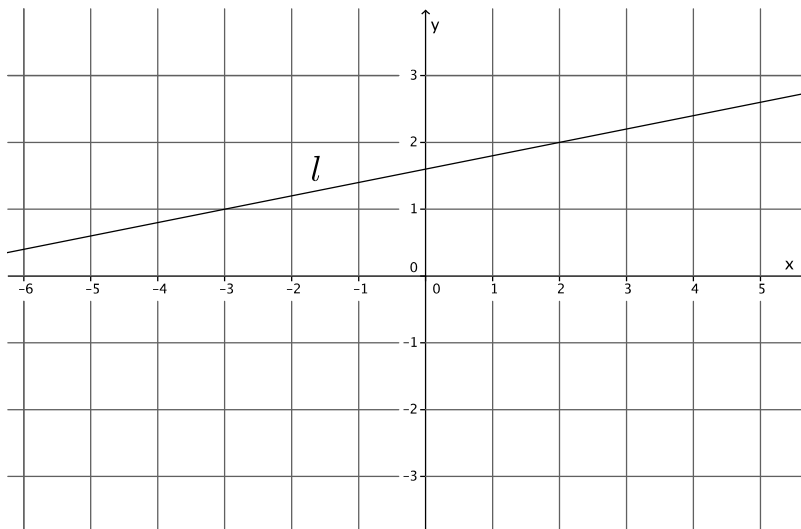
1. Write the equation for the line l shown in the figure.



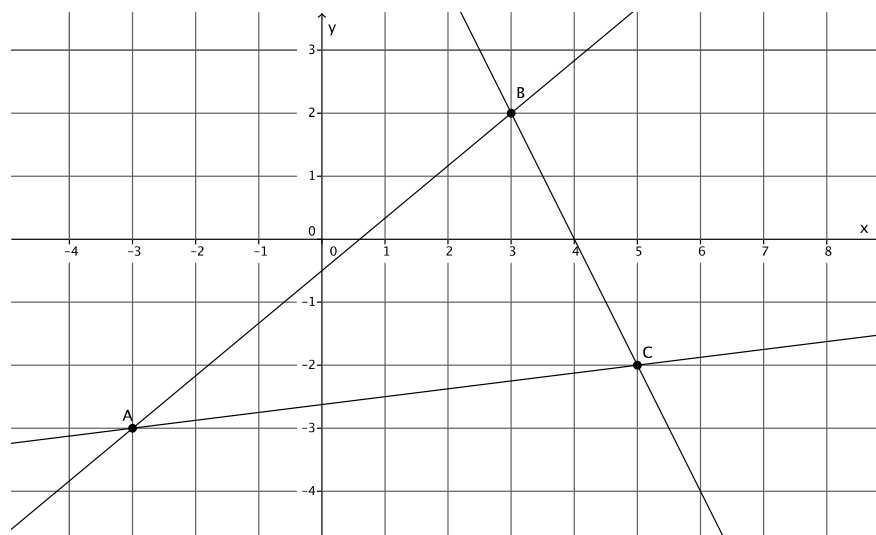
2. Write the equation for the line l shown in the figure.



3. Write the equation for the line l shown in the figure.



4. Triangle ABC is made up of line segments formed from the intersection of lines L_{AB} , L_{BC} , and L_{AC} . Write the equations that represent the lines that make up the triangle.



5. Write the equation for the line that goes through point $(-10, 8)$ with slope $m = 6$.
6. Write the equation for the line that goes through point $(12, 15)$ with slope $m = -2$.
7. Write the equation for the line that goes through point $(1, 1)$ with slope $m = -9$.
8. Determine the equation of the line that goes through points $(1, 1)$ and $(3, 7)$.