

## Line Equations

The default way of writing the equation of a line is

$$y = mx + c.$$

Remember also that the gradient between two points is given by

$$\text{grad} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}.$$

Also remember that given a point that a line goes through  $(x_1, y_1)$  and its gradient, the line's equation is

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

Find the equations of the following lines in the form  $y = mx + c$

1. Line with gradient 4, passing through the point  $(2, -5)$ .  $y = 4x - 13$

2. The line that passes through  $(1, 1)$  and  $(4, 7)$ .  $y = 2x - 1$

3. Line with gradient  $-1$ , passing through the point  $(3, 2)$ .  $y = -x + 5$

4. The line that passes through  $(2, -3)$  and  $(0, 1)$ .  $y = -2x + 1$

5. Line with gradient  $\frac{1}{2}$ , passing through the point  $(10, 3)$ .  $y = \frac{1}{2}x - 2$

6. The line that passes through  $(0, 1)$  and  $(6, 4)$ .  $y = \frac{1}{2}x + 1$

7. Line with gradient  $-\frac{1}{3}$ , passing through the point  $(1, -4)$ .  $y = -\frac{1}{3}x - \frac{11}{3}$

8. The line that passes through  $(-3, 0)$  and  $(1, -1)$ .  $y = -\frac{1}{4}x - \frac{3}{4}$

9. Line with gradient  $\frac{2}{3}$ , passing through the point  $(0, 0)$ .  $y = \frac{2}{3}x$

10. The line that passes through  $(-3, 2)$  and  $(4, -1)$ .  $y = -\frac{3}{7}x + \frac{5}{7}$

11. Line with gradient  $-\frac{5}{2}$ , passing through the point  $(-3, 0)$ .  $y = -\frac{5}{2}x - \frac{15}{2}$

12. The line that passes through  $(\frac{1}{2}, \frac{3}{2})$  and  $(4, -1)$ .  $y = -\frac{5}{7}x + \frac{13}{7}$

13. Line with gradient  $\frac{7}{8}$ , passing through the point  $(-\frac{1}{2}, \frac{5}{3})$ .  $y = \frac{7}{8}x + \frac{101}{48}$

14. The line that passes through  $(-\frac{2}{3}, \frac{7}{3})$  and  $(\frac{4}{5}, 1)$ .  $y = -\frac{10}{11}x + \frac{19}{11}$