## PARALLEL AND PERPENDICULAR LINES

To write the equation of a straight line, you need enough information to be able to determine its gradient and a point that lies on the line.

### TASK 1      Parallel lines

**1** Parallel lines have the same gradient. Use this to determine the equations of these lines.

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|---|---|
| **a** The line parallel to $y = 5x$ that passes through $(7, 0)$ | **b** The line parallel to $y = x + 9$ that passes through $(2, -1)$ |
| **c** The line parallel to $3x + y = 2$ and passing through the origin (*Be careful*: Rearrange the equation first to read the gradient.) | **d** The line parallel to $x + 5y - 7 = 0$ and passing through $(-5, 1)$ (*Be careful*: First rearrange the equation.) |

**2** The equation $y = \dfrac{x}{2} + b$ defines **a family** of parallel lines, some of which are shown in this graph.

What is the equation of the member of this family that passes through $(\dfrac{1}{3}, 6)$?
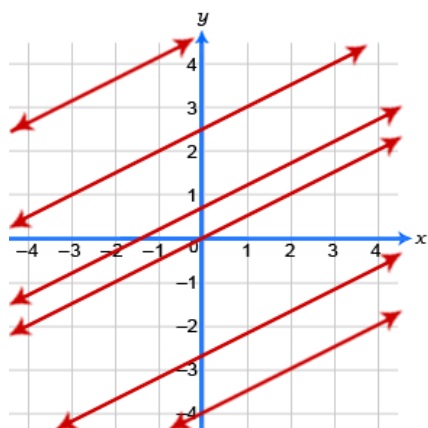
**1** Perpendicular lines have gradient that are negative reciprocals (ie multiply to give –1). Use this to determine the equations of these lines.

| | |
|---|---|
| **a** The line perpendicular to $y = \dfrac{x}{4} + 7$ that passes through the origin | **b** The line perpendicular to $y = 5x - 1$ that passes through $(-4, -6)$ |
| **c** The line perpendicular to $x + y = 7$ and passing through the origin (Rearrange the equation to find gradient.) | **d** The line perpendicular to $y = 8$ and passing through $(-5, 1)$ |

**2** Write the equation of the line that has the same $y$-intercept as the graph of $6x + 2y - 5 = 0$ but is perpendicular to it.