

PARALLEL & PERPENDICULAR LINES

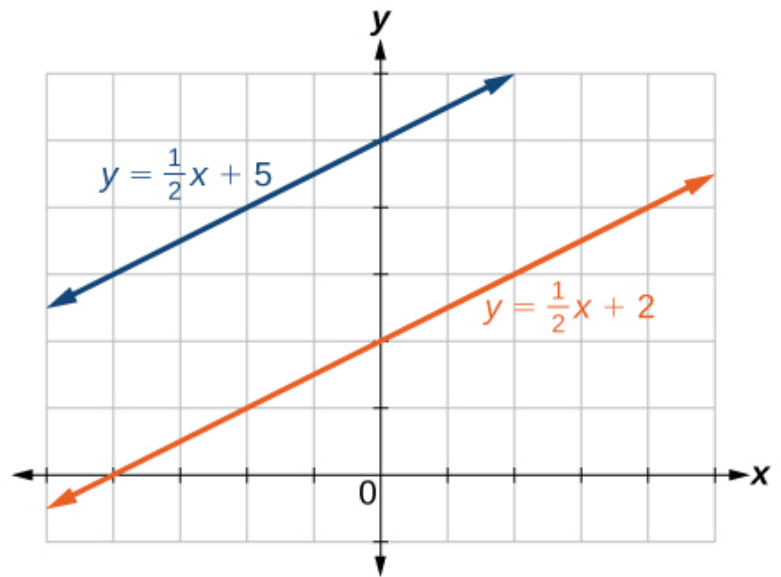
Parallel Lines

The [slope](#) is the value a in the [equation of a line](#):

$$y = ax + b$$

How do we know when two lines are **parallel**?

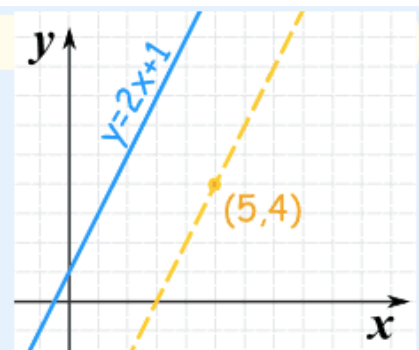
(what do you notice from the picture?)



Example:

Find the equation of the line that is:

- parallel to $y = 2x + 1$
- and passes through the point $(5,4)$



Perpendicular Lines

Two lines are Perpendicular when they meet at a right angle (90°).

To find a perpendicular slope

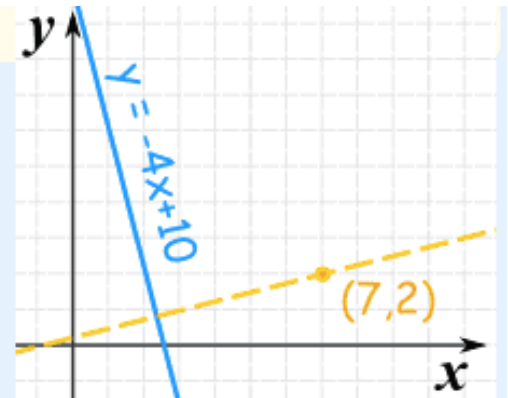
When one line has a slope of m , a perpendicular line has a slope of $-\frac{1}{m}$.

- In other words the **negative reciprocal**

Example:

Find the equation of the line that is

- perpendicular to $y = -4x + 10$
- and passes through the point $(7, 2)$



Summary

- parallel lines: **same** slope
- perpendicular lines: **negative reciprocal** slope ($-1/m$)

A: $y = 2x + 3$

B: $y = 2x - 5$

C: $y = -2x + 3$

Which lines are parallel?

A A and B

B A and C

C B and C

D They are all parallel

What is the equation of the line:

* perpendicular to the line $y = \frac{1}{2}x - 7$ and

* passing through the point $(3, -4)$?

A $y = -2x + 2$

B $y = 2x - 10$

C $y = \frac{1}{2}x - 5\frac{1}{2}$

D $y = -2x - 5$

What is the equation of the line:

* parallel to the line $y = -\frac{1}{4}x + 5$ and

* passing through the point $(2, -1)$?

A $y = -\frac{1}{4}x - 1\frac{1}{2}$

B $y = -\frac{1}{4}x - \frac{1}{2}$

C $y = \frac{1}{4}x - 1\frac{1}{2}$

D $y = 4x - 9$