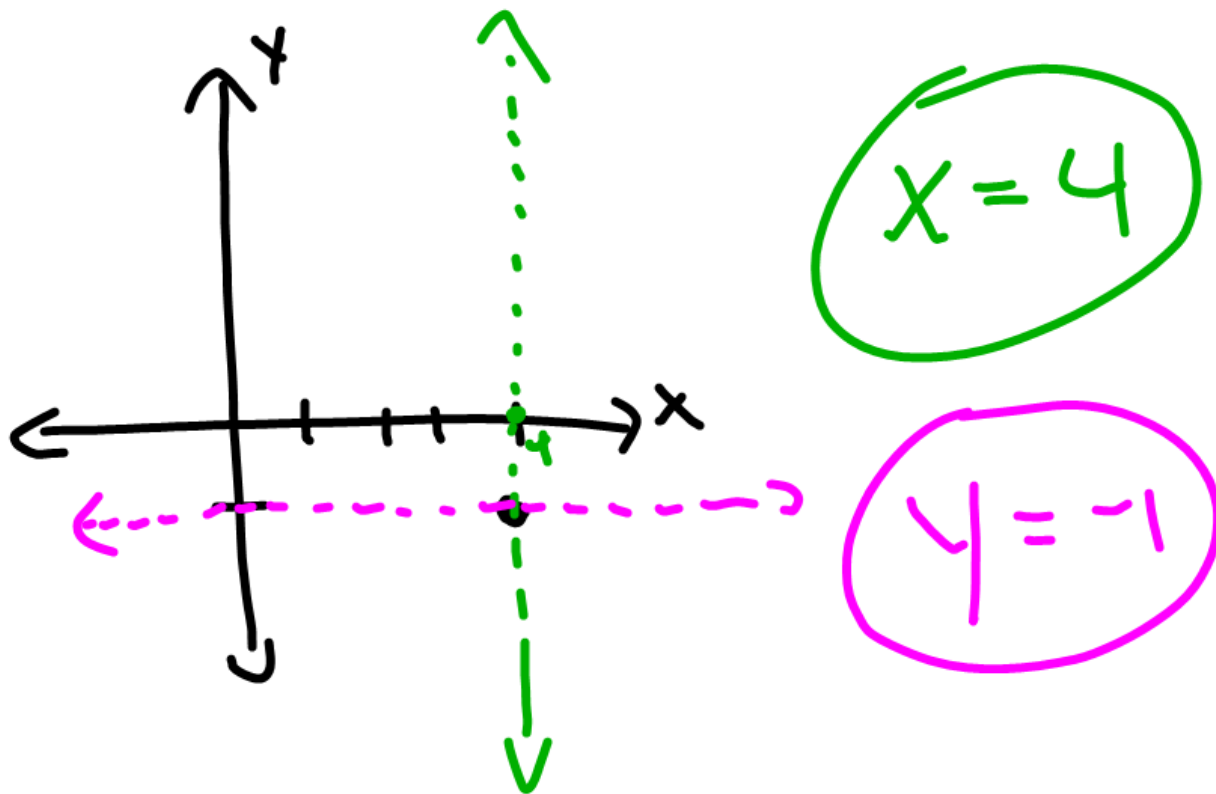


Warm-up

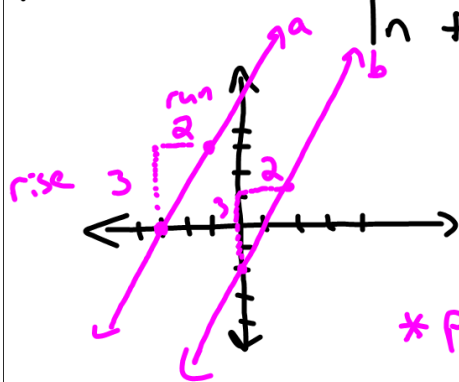
① Write the equation for horizontal & vertical lines through $(4, -1)$.



5.5 Parallel & Perpendicular

Parallel lines → Never touch (intersect)

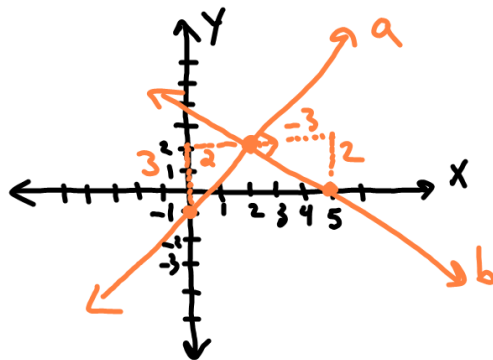
In the same plane



$$\left. \begin{array}{l} \text{Slope of } a = \frac{3}{2} \\ \text{Slope of } b = \frac{3}{2} \end{array} \right\} \text{Same!}$$

* parallel lines have same slope

Perpendicular lines → Cross at a 90° angle



$$\text{Slope of } a = \frac{3}{2}$$

$$\text{Slope of } b = -\frac{2}{3}$$

* are opposite in sign (+ to -)
* #'s are flip-flopped (or reciprocal)

* If slope = $\frac{a}{b}$, for \perp slope, is $-\frac{b}{a}$
(perpendicular)

Σ examples

Write an eqn of line parallel to $y = 3x - 1$
through $P(-3, -5)$

Given slope of 3.

Want parallel slope, so $m=3$

1st - Find slope
we are given:
Slope we want

2nd - Write the
equation using
 m & point

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

$$y + 5 = 3(x + 3)$$

② Write for \perp line $y=2x+3$ thru $P(4,-5)$.

Slope given: 2

\perp slope: $\left(-\frac{1}{2}\right)$

$$y+5 = -\frac{1}{2}(x-4)$$

Homework

Write eqn for line parallel

③ $(-1, 3)$, $y = 2x + 5$ ⑥ $(-1, 2)$, $y = 5x + 4$

Write eqn for line \perp

⑱ $(-9, 2)$, $y = 3x - 12$ ⑳ $(7, 10)$, $y = \frac{1}{2}x - 9$

Are the lines parallel, \perp or neither?

⑫ ① $y = 4x - 2$ ⑥ $y = -\frac{1}{4}x + 1$ ③ $y = \frac{1}{4}x - 3$

⑬ Besides Kiss, what is the greatest rock band?