

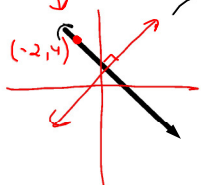
Parallel and Perpendicular Lines

- Parallel slopes are equal
- Perpendicular slopes are negative reciprocals

ex 2 and $-\frac{1}{2}$
 $-\frac{3}{4}$ and $\frac{4}{3}$

Example 1

Write the equation of a line that passes through $(-2, 4)$ and is perpendicular to $2x - 3y + 5 = 0$.



← general form
 ① change to $y = mx + b$ (slope-intercept form)

$$2x - 3y + 5 = 0$$

$$\frac{2x + 5}{3} = \frac{3y}{3}$$

$$y = \frac{2}{3}x + \frac{5}{3}$$

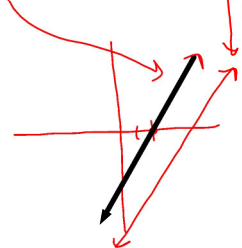
$$m = \frac{2}{3}$$

② $\perp m = -\frac{3}{2}$

③ Write the eqn in slope-point form x_1, y_1
 pt $(-2, 4)$ $m = -\frac{3}{2}$
 $y - y_1 = m(x - x_1)$
 $y - 4 = -\frac{3}{2}(x + 2)$

Example 2

Write the equation of a line with an x-intercept of 2 and parallel to the line $3x - 2y = 6$.



(standard form)

$3x - 2y = 6 \rightarrow$ change to $y = mx + b$
 $-2y = -3x + 6$
 $y = \frac{3}{2}x - 3$
 $m = \frac{3}{2}$

$\parallel m = \frac{3}{2}$ pt $(2, 0)$

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

$$y - 0 = \frac{3}{2}(x - 2)$$

$$y = \frac{3}{2}(x - 2)$$

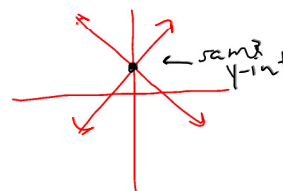
LF L7 Slope-Point Form of Equation...again recovered.notebook

Example 3

Two perpendicular lines intersect on the y-axis. One line has the equation $y - 3 = \frac{1}{2}(x + 4)$. Determine the equation of the other line.

$$\begin{aligned} &\uparrow \\ &m = \frac{1}{2} \\ \perp m &= -2 \end{aligned}$$

$$\begin{aligned} \text{y-int} \\ x &= 0 \\ y - 3 &= \frac{1}{2}(0 + 4) \\ y - 3 &= 2 \\ y &= 5 \end{aligned}$$



$$\perp m = -2 \quad \text{pt } (x_1, y_1) \\ (0, 5)$$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 5 &= -2(x - 0) \\ y - 5 &= -2x \end{aligned}$$

or

$$\perp m = -2 \quad \text{y-int } 5$$

$$\begin{aligned} y &= mx + b \\ y &= -2x + 5 \end{aligned}$$

Assignment: Day 1: Pg. 372; 4 (a,c,e), 5(a,c), 6 (a,d), 9, 11(a,b), 14
Day 2: Pg. 372; 20a, 21, 22, 23, 24