

Parallel & Perpendicular

* parallel: same slope, different y-intercept



ex: $y = 2x - 9$ & $y = 2x + 1/2$

* perpendicular: opposite reciprocal slope



ex: $y = \frac{2}{3}x + 1$ & $y = -\frac{3}{2}x - 5$

are the two lines ||, ⊥, neither?

ex1 $L_1: y = 5x - 4$
 $L_2: y = -5x + 2$
 neither

ex2 $L_1: y = -\frac{3}{2}x + 4$
 $L_2: y = \frac{2}{3}x - 5$
 perpendicular

ex3 $L_1: 3x + 5y = 9$
 $L_2: -6x - 10y = 12$

$$\begin{aligned} 3x + 5y &= 9 & -10y &= 6x + 12 \\ 5y &= -3x + 9 & y &= -\frac{3}{5}x - \frac{12}{10} \\ y &= -\frac{3}{5}x + \frac{9}{5} \end{aligned}$$

parallel

ex4 slope-intercept of $(2, -1)$
 a) parallel } $2x - 3y = 5$
 b) perpendicular }

① slope: $-3y = -2x + 5$
 $y = \frac{2}{3}x - \frac{5}{3}$

a) $-1 = \frac{2}{3}(2) + b$

$-1 = \frac{4}{3} + b$

$-\frac{7}{3} = b$

$$y = \frac{2}{3}x - \frac{7}{3}$$

b) $-1 = -\frac{3}{2}(2) + b$

$-1 = -3 + b$

$2 = b$

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

ex 5 $y - 4 = 0$ pt: $(-5, 7)$

$y = 4$

a) parallel: $y = 7$

b) perpendicular: $x = -5$