# 3-6 Notes

Monday, February 19, 2024 9:39 PM

**Parallel Lines** - have the same slope but different y-intercept

**Perpendicular Lines** - have opposite and reciprocal slopes

**2.** Is the line $y = \frac{1}{2}$ perpendicular to the line $y = -4$?

$y = \frac{1}{2}$ → $m = 0$

$y = -4$ → $m = 0$

No, but they are parallel

**4.** Is the line $x = 4$ parallel to the line $x = -4$?

$x = 4$ → $m = \varnothing$ $x = -4$ → $m = \varnothing$

Yes, same slope

**6.** Is the line $y = -2x + \frac{2}{3}$ parallel to the line $y = -2x + 3$?

$y = -2x + \frac{2}{3}$ → $m = -2$

$y = -2x + 3$ → $m = -2$

Yes

**8.** Is the line $y = \frac{1}{2}x + \frac{3}{2}$ perpendicular to the line $y = -\frac{1}{2}x + \frac{3}{2}$?

$y = \frac{1}{2}x + \frac{3}{2}$ → $m = \frac{1}{2}$

$y = -\frac{1}{2}x + \frac{3}{2}$ → $m = -\frac{1}{2}$

No, $\frac{1}{2}$ and $-\frac{1}{2}$ are not reciprocals

**10.** Are the lines $2x - 4y = 3$ and $2x + 4y = -3$ parallel?

$-2x$ $-2x$ $-2x$ $-2x$

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

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

No

**14.** Is the line that contains the points $(4, -3)$ and $(2, 5)$ parallel to the line that contains the points $(-2, -3)$ and $(-4, 1)$?

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3-5}{4-2} = \frac{-8}{2} = -4$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3-1}{-2-(-4)} = \frac{-4}{2} = -2$

No

**20.** Find the equation of the line containing the point (3, 2) and parallel to the line $3x + y = -3$.

$y = mx + b$

need $m$

$-3x \quad -3x$

$y = -3x - 3$

$m = -3$

$y = -3x + b$

plug: use (3, 2)

$2 = -3(3) + b$

$2 = -9 + b$

$11 = b$

$y = -3x + 11$

**22.** Find the equation of the line containing the point (2, −5) and perpendicular to the line $y = \frac{5}{2}x - 4$.

need $m$

$m = \frac{5}{2}$ perp. $\rightarrow -\frac{2}{5}$

$y = -\frac{2}{5}x + b$

plug: (2, −5)

$-5 = -\frac{2}{5}(2) + b$

$-5 = -\frac{4}{5} + b$

$-\frac{25}{5} = -\frac{4}{5} + b$

$+\frac{4}{5} \quad +\frac{4}{5}$

$b = -\frac{21}{5}$

$y = -\frac{2}{5}x - \frac{21}{5}$