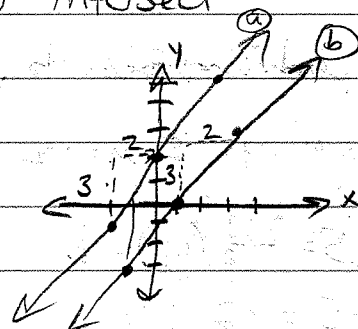


5.5 Parallel & Perpendicular Lines

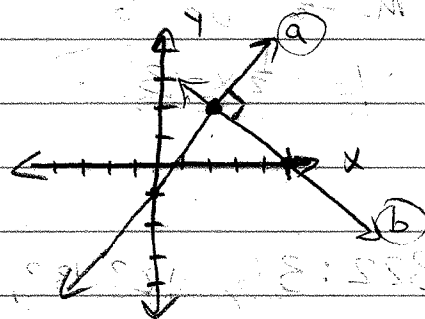
Parallel Lines \rightarrow In same plane & never intersect

Slope of $a = \frac{3}{2}$
Slope of $b = \frac{3}{2}$ } have Same slope



Perpendicular Lines \rightarrow In same plane & intersect at 90° angle

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



Slopes are opposite in sign & reciprocals.

$$\frac{3}{2} \cdot -\frac{2}{3} = -1$$
$$\frac{a}{b} = -\frac{b}{a}$$

Examples

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

Parallel slope of 3 = 3

1st - Find slope you want

$$x = -3, y = -5, m = 3$$

2nd - Plug slope & point into

$$y = mx + b$$

$$y = mx + b$$

$$-5 = 3(-3) + b$$

$$-5 = -9 + b$$

$$4 = b$$

3rd - Plug m & b into $y = mx + b$

$$m = 3 \quad b = 4$$

$$y = 3x + 4$$

② Write eqn perpendicular to $y=2x+3$ through $P(4,-5)$

Perpendicular Slope to 2 is $-\frac{1}{2}$

$$x=4, y=-5, m=-\frac{1}{2}$$

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

$$\begin{array}{r} -5 \\ +2 \quad +2 \\ \hline -3 = b \end{array}$$

$$-3 = b$$

$$m = -\frac{1}{2} \quad b = -3$$

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

1st - Find Slope you need

2nd - Plug into $y=mx+b$

3rd - Plug m & b into $y=mx+b$

p322: 3, 6, 12?, 13?, 19, 21 ← write on board??