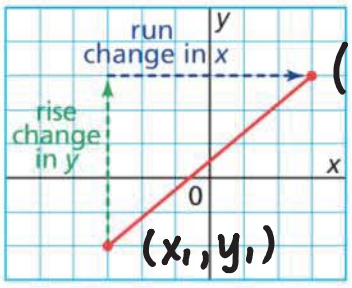
Chapter 6 Final Review

The Slope of a Line



$m = \frac{\text{rise}}{\text{run}}$ } when given a graph

$m = \frac{y_2 - y_1}{x_2 - x_1}$ } when given two points

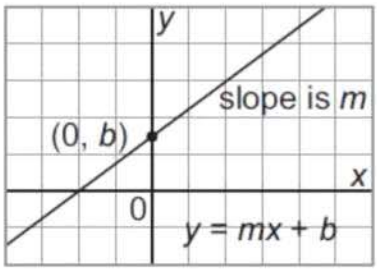
Equation of a line in Slope-Intercept Form

$y = mx + b$ → y-intercept

dependent variable

independent variable

slope



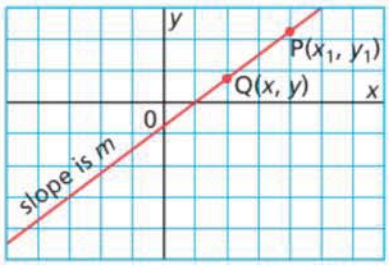
Equation of a line in Slope-Point Form

$y - y_1 = m(x - x_1)$ coord. of a point

dep. variable

slope

indep. variable



Example: Write the equation of a line in slope-point form for a line that has a slope of $\frac{4}{5}$ and passes through the point $(-2, 4)$.

m

x_1 y_1

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

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

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

Example: Rewrite the equation from the previous example into slope-intercept form.

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

$y-4=\frac{4}{5}x+\frac{8}{5}$

$+4 \qquad +4$

$y=\frac{4}{5}x+\frac{8}{5}+\frac{4}{1}\cdot\frac{5}{5}$

$y=\frac{4}{5}x+\frac{8}{5}+\frac{20}{5}$

$y=\frac{4}{5}x+\frac{28}{5}$

Equation of a line General Form

$Ax+By+C=0$

- A must be positive
- no fractions

Example: Rewrite the equation from the previous example into general form.

$5\left(y=\frac{4}{5}x+\frac{28}{5}\right)$

$5y=4x+28$

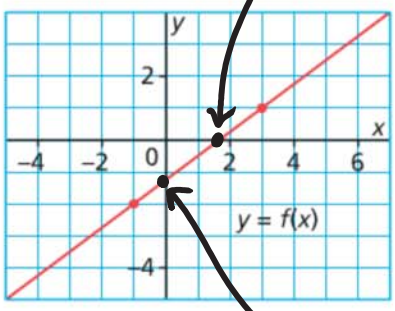
$-5y \qquad -5y$

$0=4x-5y+28$

X & Y Intercepts

x – intercept
- the value of x when $y=0$
- where the graph crosses the x axis.

y – intercept
- the value of y when $x=0$
- where the graph crosses the y axis.



Example: Find the x and y intercepts of the following linear function: $3x-5y+12=0$

x-int $(y=0)$

$3x-5(0)+12=0$

$3x+12=0$

$-12 \qquad -12$

$\frac{3x}{3}=\frac{-12}{3}$

$x=-4$

y-int. $(x=0)$

$3(0)-5y+12=0$

$-5y+12=0$

$-12 \qquad -12$

$\frac{-5y}{-5}=\frac{-12}{-5}$

$y=\frac{12}{5}$

Parallel and Perpendicular Lines

Parallel Lines
- Lines that have the same slope and different y-intercepts.
- Lines will never intersect

Perpendicular Lines
- Lines with slopes that are negative reciprocals of each other.

Example: Determine whether the following pairs of lines are parellel are perpendicular to each other.

a) $y = 2x + 4$ ✓
$-4x + 2y = 7$

↓

$-4x + 2y = 7$

$+4x \quad +4x$

$\frac{2y}{2} = \frac{4x}{2} + \frac{7}{2}$

$y = 2x + \frac{7}{2}$

both lines have $m = 2$;

lines are parallel

b) $y = \frac{1}{3}x + 4$ ✓
$12x + 4y + 20 = 0$

↓

rewrite in slope-intercept form and compare.

$12x + 4y + 20 = 0$

-20

$-12x \quad -12x - 20$

$\frac{4y}{4} = \frac{-12x}{4} - \frac{20}{4}$

$y = -3x - 5$

slopes are negative reciprocals of each other; lines are perpendicular