Chapter 6. Linear Equations and Functions in Two Variables

Graphing Methods for ax + by = c

Table of values, $b \neq 0$	Solve for y Generate a table of x and y values Plot the coordinate pairs and connect
Intercepts, $a \neq 0, b \neq 0, c \neq 0$	Generate a table of x and y values where first x = 0 and then y = 0 Plot both intercepts and connect Check with a third point
Slope-Intercept, $b \neq 0$	Solve for y = mx + b m = slope, y-intercept = (0, b) Plot y-intercept Use Rise over Run to move to another point Connect the points

Comparing graphs of two linear equations in two variables, $y = m_1 x + b_1$, $y = m_2 x + b_2$

Case	Slopes	Intercepts, (0, b)
Two lines are **parallel** if:	$m_1 = m_2$	$b_1 \neq b_2$
Two lines are **coinciding** if:	$m_1 = m_2$	$b_1 = b_2$
Two lines are **intersecting only** if:	$m_1 \neq m_2$	Don't care
Two lines are **perpendicular** if:	$m_1 \bullet m_2 = -1$, negative reciprocals	Don't care

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Finding Equations from information about graphs

Case 1. Given the **slope**, m, and **y-intercept**, (0, b)	Use the values for **m** and **b** in the equation **y = mx + b**
Case 2. Given the **slope**, m, and a **point** the line passes through, (x_1, y_1)	Use the values for **m**, $\mathbf{x_1}$, and $\mathbf{y_1}$ in the equation $\mathbf{y - y_1 = m(x - x_1)}$
Case 3. Given **two points** the line passes through, (x_1, y_1), (x_2, y_2)	Calculate the **slope** as $m = \frac{y_2 - y_1}{x_2 - x_1}$ Then use the **slope** and **either one of the two points** in Case 2.
Case 4. Given a **point** the line passes through, (x_1, y_1), and the graph's relation to **another equation**: a) **Same slope** as the other equation b) **Parallel** to the other equation c) **Perpendicular** to the other equation	a) Find the slope of the other equation and use that **same slope** and the **point** in Case 2. b) Find the slope of the other equation and use that **same slope** and the **point** in Case 2. c) Find the slope of the other equation, and then find its negative reciprocal. Use the **negative reciprocal slope** and the **point** in Case 2.