

Terms: Chapter 3. Relations, functions, and graphs
 (Focus on linear equations and straight-lines)

Relation: Ordered pair
 Domain: All possible input values
 Range: All possible output values

Function: A relation with one output for each input
 Vertical line test

Linear equations (straight lines):

1. No product of variables.
2. No variable has a power greater than 1.
3. No variable in the denominator.

Slope:

$$m = \frac{\text{rise}}{\text{run}} = \frac{(y_2 - y_1)}{(x_2 - x_1)}$$

Horizontal line slope: 0
 Vertical line slope: undefined

Slope-intercept form	$y = mx + b$	m is slope b is y-intercept
Point-slope form	$(y - y_1) = m \cdot (x - x_1)$	m is slope Line contains point (x_1, y_1)
Two points form	$(y - y_1) = \left(\frac{y_2 - y_1}{x_2 - x_1}\right) \cdot (x - x_1)$	Line contains point (x_1, y_1) and (x_2, y_2)
Standard form	$Ax + By + C = 0$	Slope is $m = -\frac{A}{B}$, if $B \neq 0$

Parallel lines: Equal slope: $m_2 = m_1$, different intercept

Perpendicular lines: $m_2 = -\frac{1}{m_1}$

More on functions

One-to-One function: One input for each valid output
 Horizontal line test

Function composition: $f(g(x))$; $(f \circ g)(x)$