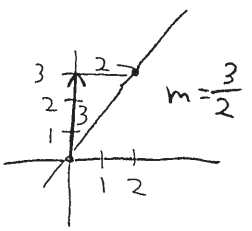
# Basic Graphing (Lines)




$$\text{slope} = m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$$

slope-intercept form of an equation of a line:

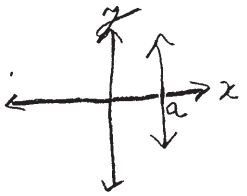
$$y = mx + b$$

($m$: slope; $b$: y-intercept)

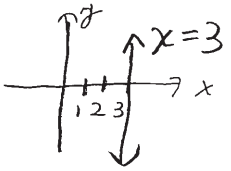
point-slope form: $y - y_1 = m(x - x_1)$

Standard form: $Ax + By = C$ $\left(\text{slope} = -\frac{A}{B},\ y\text{-int.} = \frac{C}{B}\right)$

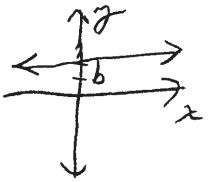
equation of a vertical line: $x = a$



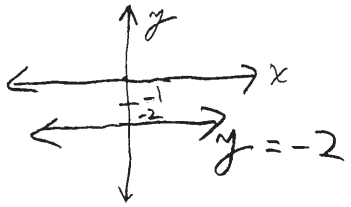

example:




equation of a horizontal line: $y = b$




example:




slope of a horizontal line = 0 example: $m = \frac{0}{5} = 0$

slope of a vertical line is undefined example: $m = \frac{3}{0}$ is undefined

parallel lines have the same slope $m_1 = m_2$

perpendicular lines have negative reciprocal slopes $m_1 = -\frac{1}{m_2}$

examples: $m = \frac{1}{3}$ $m_\perp = -3$, $m = -4$ $m_\perp = \frac{1}{4}$

Find the x-intercept by substituting $y = 0$ into the equation.
Find the y-intercept by substituting $x = 0$ into the equation.