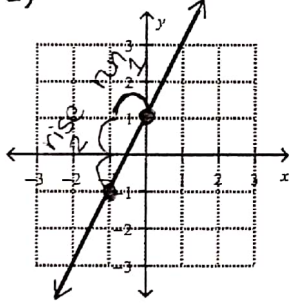
SLOPE: Slope describes the rate of change of a line. (also called: unit rate, common difference)

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

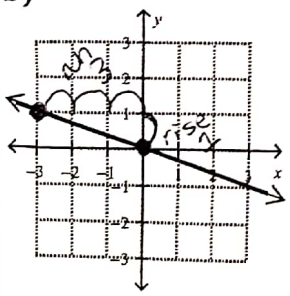
From a Graph

1. Choose two points on the graph.
2. Count the rise from one point to the next. Then the run.
3. Write the slope as $\frac{y}{x}$.

a) $\frac{\text{rise}}{\text{run}} = \frac{2}{1} = 2$



b) $\frac{\text{rise}}{\text{run}} = \frac{-1}{3}$



From an Equation

1. The equation must be in slope-intercept form ($y = mx + b$).
2. Slope is the coefficient (m) of x, the number in front of x.

a) $y = \frac{4}{3}x - 12$ ↑ slope

b) $y = -3x - 2$ ↑ slope

c) $y = 15x + 7$ ↑ slope

d) $y = -0.1x$ ↑ slope

From a Table

1. Find the constant rate of change of the x-values and the y-values.
2. Write the change as $\frac{y}{x}$.

a)

x	-1	0	1	2
y	0	2	4	6

$\Delta x = +1$ $+1$ $+1$

$\Delta y = +2$ $+2$ $+2$

$\frac{\Delta y}{\Delta x} = \frac{2}{1} = 2$

b)

x	y	
3	20	−4
6	16	−8
12	8	−4
15	4	

(+3, +6, +3)

$\frac{\Delta y}{\Delta x} = \frac{-4}{3}$ ← same!

$\frac{\Delta y}{\Delta x} = \frac{-8 \div 2}{6 \div 2} = \frac{-4}{3}$

From a Word Problem

1. Look for key words like each, every, or per.
2. This is your rate of change.

a) Jack has five toy trains. He plans to buy two new ones each month. $y = mx + b$ (m ↑ slope, b ↑ initial value)

$y = 2x + 5$

b) The initial fee to have a website set up using a server is $48. It costs $44 per month to maintain the website.

$y = 44x + 48$

c) An online camera store charges $1.49 for every 8x10 picture that you order. The shipping cost is $5.50.

$y = 1.49x + 5.50$

From Two Points

1. Label your x and y coordinates.
2. Find the change in y and the change in x using the slope formula $\frac{y_2 - y_1}{x_2 - x_1}$.

a) $(\overset{x_1}{0}, \overset{y_1}{5})$ and $(\overset{x_2}{4}, \overset{y_2}{17})$

$\frac{17 - 5}{4 - 0} = \frac{12}{4} = 3$

b) $(\overset{x_1}{-12}, \overset{y_1}{-10})$ and $(\overset{x_2}{0}, \overset{y_2}{-6})$

$\frac{-6 - (-10)}{0 - (-12)} = \frac{-6 + 10}{0 + 12} = \frac{4}{12} = \frac{1}{3}$

c) $(\overset{x_1}{0}, \overset{y_1}{7})$ and $(\overset{x_2}{-5}, \overset{y_2}{11})$

$\frac{11 - 7}{-5 - 0} = \frac{4}{-5}$