

Name: _____

Notes

Algebra Section 5.1-5.2

Pages 283-289



Date: _____

Goal: "You will write equations of lines"

Slope – intercept form:

$$y = mx + b$$



Situation 1: Write the equation of a line in slope – intercept form if given slope and the y – intercept

Ex:

Slope: -2

y – intercept: 5

$$y = -2x + 5$$

Ex:

Slope: 8

y – intercept: -7

$$y = 8x - 7$$

Ex:

Slope: 4

y – intercept: -3

$$y = 4x - 3$$

Ex:

Slope: $\frac{3}{4}$

y – intercept: -3

$$y = \frac{3}{4}x - 3$$

Ex:

Slope: 0

y – intercept: 5

$$y = 5$$

Ex:

Slope: -1

y – intercept: 0

$$y = -x$$

Situation 1: Write the equation of a line in slope – intercept form given the slope and one point:

1. Plug in x , y , and m

Ex: slope: -4 , passes through $(-1, 3)$

$$3 = -4(-1) + b$$

$$b = -1$$

2. Solve for b

3. Plug in m and b

$$y = -4x - 1$$

Try These:

Write the equation of the line with the given slope that passes through the given point.

Ex: $(6, 3)$, slope = 2

Ex: $(6, 3)$ slope: -2

$$y = 2x - 9$$

$$y = -2x + 15$$

Situation 2: Write the equation of the line in slope – intercept form that passes through the given points:

1. Find the slope

Ex: $(-2, 5)$ $(2, -1)$

$$m = -\frac{3}{2}$$

2. Plug in m and one point $(x$ and $y)$

$$-1 = -\frac{3}{2}(2) + b$$

3. Solve for b

$$2 = b$$

4. Plug in m and b

$$y = -\frac{3}{2}x + 2$$

Try These:

Write the equation of the line in slope – intercept form that passes through the given points:

Ex: $(3, 0)$ $(2, -4)$

Ex: $(1, -2)$ $(5, 4)$

$$y = 4x - 12$$

$$y = \frac{3}{2}x - \frac{7}{2}$$

Real – world connection: $y = mx + b$

*In the real world, $m =$ constant rate of change
and $b =$ initial value.

Ex: A recording studio charges musicians an initial fee of \$50 to record an album. Studio time costs an additional \$35 per hour.

a) Write an equation that gives the total cost to record an album as a function of studio time needed.

$$y = 35x + 50$$

b) Find the total cost to make an album that takes 10 hours to record.

$$y = 35(10) + 50$$

$$y = 400$$

Ex: A dance studio charges \$20 to use the facility and \$25 per hour of instruction.

a) Write an equation that gives the total cost as a function of hours of dance instruction.

$$y = 25x + 20$$

b) Find the total cost for 2 hours of dance instruction.

$$y = 25(2) + 20$$

$$y = 70$$

Try These:

1. Your gym membership costs \$33 per month after an initial membership fee. You paid a total of \$228 after 6 months. Write an equation for the total cost as a function of the number attended. Then find the total cost for 9 months.

$$228 = 33(6) + b$$

$$228 = 198 + b$$

$$b = 30$$

$$y = 33x + 30$$

$$y = 33x + 30$$

$$y = 33(9) + 30$$

$$y = 327$$

2. In BMX racing, racers purchase a one-year membership to a track. They also pay an entry fee for each race at that track. One racer paid a total of \$125 for 5 races. A second racer paid a total of \$170 for 8 races. How much does each race cost? How much does the membership fee cost? Write an equation to find the total cost for any number of races.

$$(5, 125) (8, 170)$$

$$125 = 15(5) + b$$

$$125 = 75 + b$$

$$50 = b$$

$$m = 15$$

$$y = 15x + 50$$

3. For science class you need to know the Celsius equivalent of a room temperature of 70° Fahrenheit. To estimate, you use the facts that 32° Fahrenheit is equivalent to 0°C and that 212°F is equivalent to 100°C. Write an equation to represent degrees Celsius, C , based on degrees Fahrenheit, F .

$$(32, 0) (212, 100)$$

$$m = \frac{5}{9}$$

$$0 = \frac{5}{9}(32) + b$$

$$0 = \frac{160}{9} + b$$

$$-\frac{160}{9} = b$$

$$C = \frac{5}{9}F - \frac{160}{9}$$