Homework Review: 4.3

45

small bottles: 4¢
large bottles: 8¢
total rec.: 56¢

x = small
y = large

$4x + 8y = 56$

y-int: (x=0)

$\frac{4(0)}{8} + \frac{8y}{8} = \frac{56}{8}$

$y = 7$

(0,7)

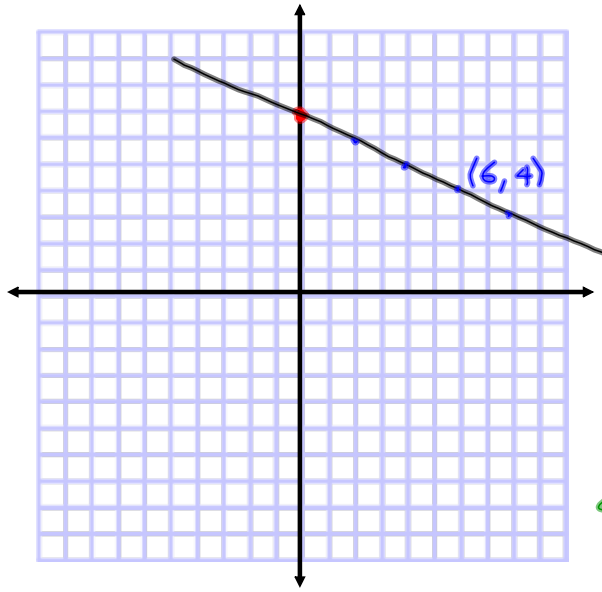
x-int: (y=0)

$\frac{4x}{4} + \frac{8(0)}{4} = \frac{56}{4}$

$x = 14$

(14,0)

(a)



(b) 0 small
7 large
or
14 small
0 large

$4x + 8y = 56$

$4(6) + 8(4) = 56$

$24 + 32 = 56$

$56 = 56$ ✓

or
6 small
4 large

21) $y = -4x + 3$

x-int ($y = 0$)

$0 = -4x + 3$

$-3 \quad -3$

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

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

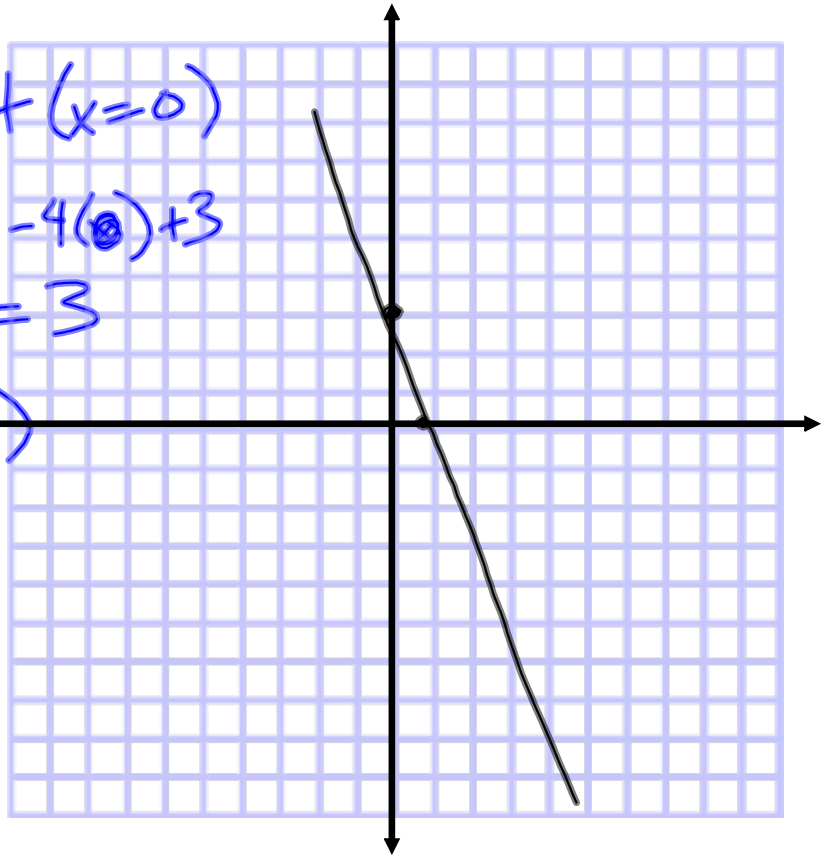
$(\frac{3}{4}, 0)$

y-int ($x = 0$)

$y = -4(0) + 3$

$y = 3$

$(0, 3)$



Slope:

The rate of change of a graph — $\frac{\text{rise}}{\text{run}}$

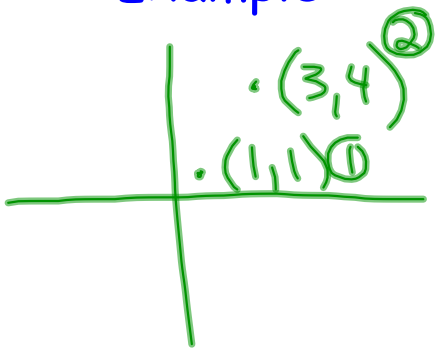
Definition

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Mathematical formula

Example:

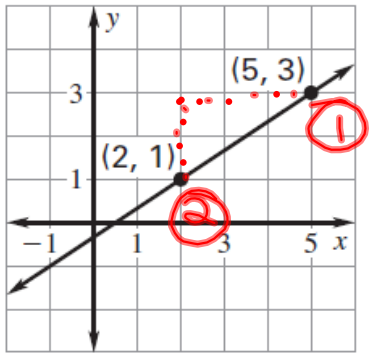
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4-1}{3-1} =$$



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

Find the slope of the line that passes through the points.

10.



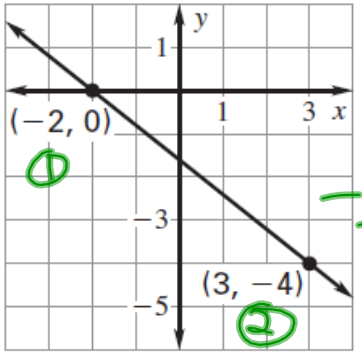
$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{1-3}{2-5} = \frac{-2}{-3}$

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

$\frac{\text{rise}}{\text{run}}$

11.



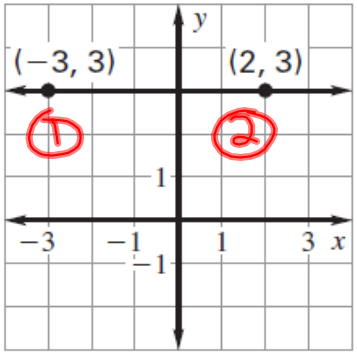
$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-4-0}{3-2} = \frac{-4}{5}$

$m = \frac{-4}{5}$

$\frac{-4}{5}$

12.



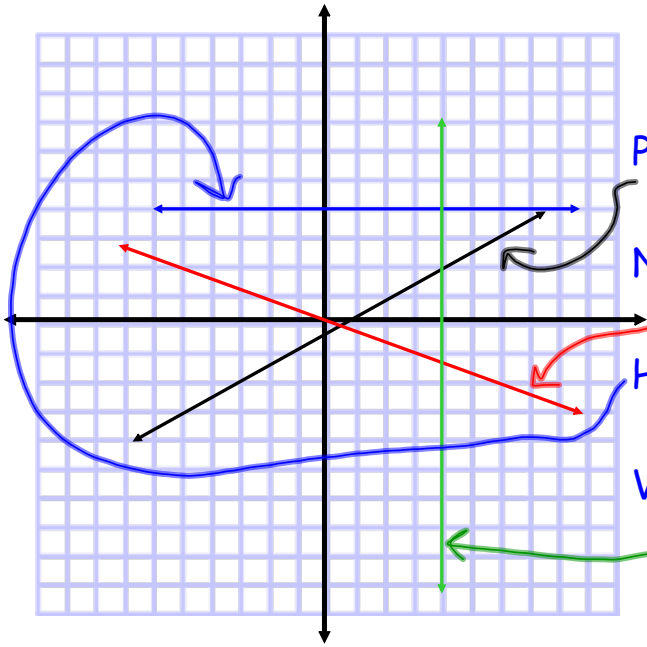
0

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{3-3}{2-3} = \frac{0}{5}$

$m = 0$

Classification of slopes:



Positive — up & to the right $\frac{+}{+}$

Negative — down & to the right $\frac{-}{+}, \frac{+}{-}, -\frac{+}{+}$

Horizontal - straight across

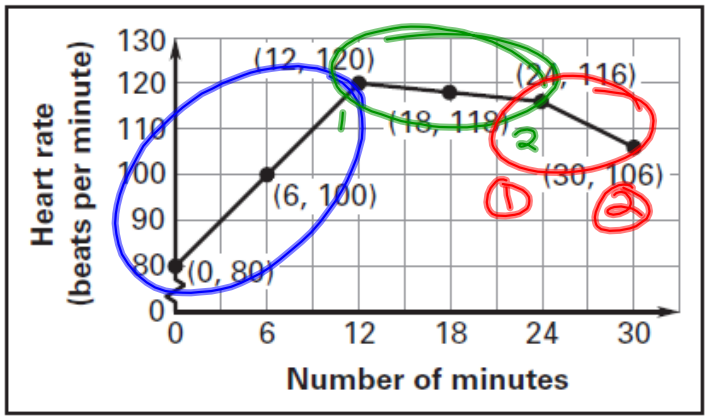
0

Vertical - up and down

$\frac{\text{rise}}{0}$ = Undefined

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

Heart Rate The graph shows the heart rate of a person during 30 minutes of exercise. Give a verbal description of the workout. By describing the slope of each section (and explaining what the slope tells you).



$\frac{40}{12} = \frac{10}{3}$ slope of 1st 12 min. Warm-up

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{116 - 120}{24 - 12} = \frac{-4}{12} = \frac{-1}{3}$ = slope of 2nd 12 min. Maintaining

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{106 - 116}{30 - 24} = \frac{-10}{6} = \frac{-5}{3}$ = slope of last 6 min. cool-down

Finding an unknown coordinate

$(-3, y), (-9, -2); m = 1$

x_1 y_1 x_2 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Set up the equation

$$1 = \frac{-2 - y_1}{-9 + 3}$$

Solve for the missing variable

$$-6 \cdot 1 = \frac{-2 - y_1}{-6} \cdot -6$$

$$-6 = -2 - y_1$$

$$+2 \quad +2$$

$$-1(-4) = (-y_1) - 1$$

$$4 = y_1$$

(-3, 4)

Find the slope of the line that passes through the points.

16. (1, 2) and (7, 7)

17. (3, 4) and (−5, 0)

18. (5, −2) and (5, 8)

Find the value of *x* or *y* so that the line passing through the two points has the given slope.

28. $(x, -7), (1, 2); m = 3$

29. $(9, y), (3, 2); m = \frac{2}{3}$

30. $(7, 5), (x, 2); m = \frac{3}{4}$

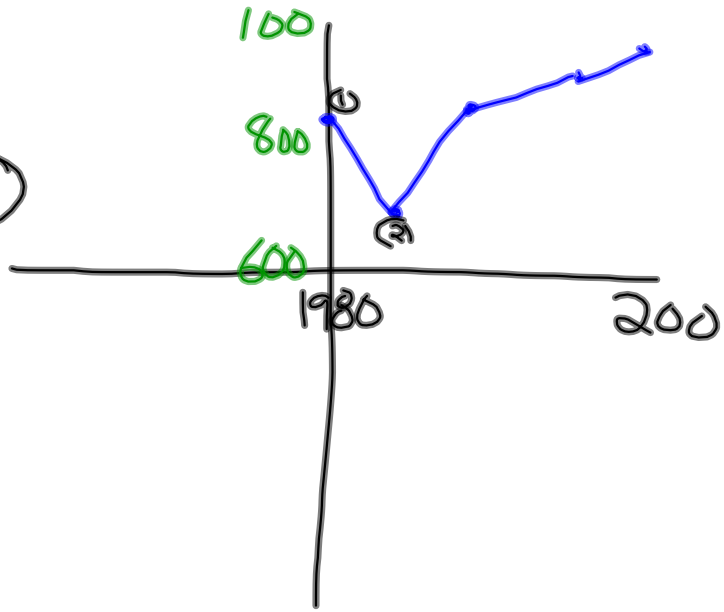
Trolley Bus The table shows the number of trolley buses in operation in the United States during certain years.

Year	1980	1985	1990	1995	2000
Number of buses	823	676	832	885	951

a. *Describe* the rates of change in the number of buses during the time period.

b. Determine the time intervals during which the number of trolley buses showed the greatest and least rates of change.

$$\frac{825-675}{1980-1985} = \frac{150}{-5} \approx -30$$



~ 30

$\frac{50}{5} \approx 10$

$\frac{75}{5} \approx 12$

Homework:

p. 239; 4-11, 19, 24, 36