

Practice Problems - Solutions
for the Calculus I/Precalculus Placement Test - Fall, 2005

Part 5

1. Give the slope and y -intercept of the linear function and sketch its graph.

a. $f(x) = -2(x - 1) + 1$

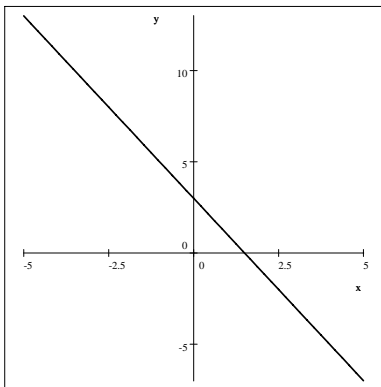
$f(x) = -2x + 2 + 1 = -2x + 3$, slope = -2 , y -intercept = 3

b. $f(x) = \frac{1}{3}x - 4$

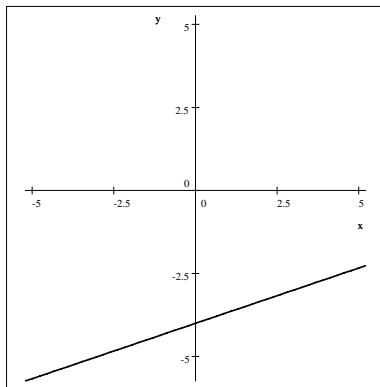
slope = $\frac{1}{3}$, y -intercept = -4

c. $f(x) = -\pi$

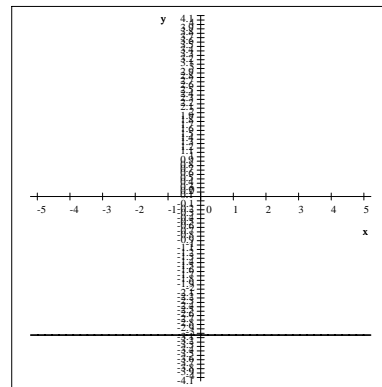
slope = 0 , y -intercept = $-\pi$



a. $y = -2x + 3$



b. $y = \frac{1}{3}x - 4$



c. $y = -\pi$

2. Give the slope and y -intercept of the linear equation in (x, y) and sketch its graph.

a. $3x + y = 2$

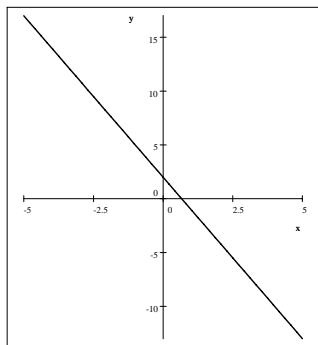
$y = -3x + 2$, slope = -3 and y -intercept = 2

b. $4x + 5y = 1$

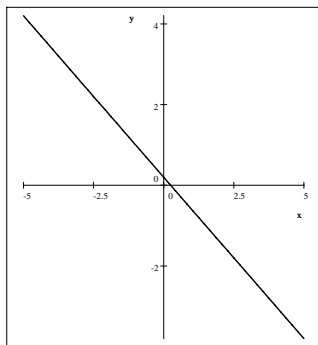
$y = -\frac{4}{5}x + \frac{1}{5}$, slope = $-\frac{4}{5}$, y -intercept = $\frac{1}{5}$

c. $y = \sqrt{2}$, slope = 0 , y -intercept = $\sqrt{2}$

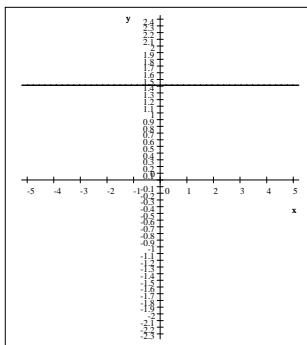
d. $x = 1$, slope does not exist and no y -intercept



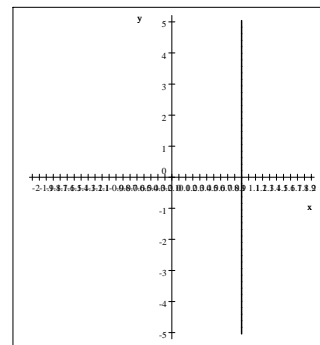
a. $y = -3x + 2$



b. $y = -\frac{4}{5}x + \frac{1}{5}$



c. $y = \sqrt{2}$



d. $y = \sqrt{2}$

3. Give the equation of the line L .

a. The slope of L is -2 and the y -intercept of L is $\frac{1}{5}$.

$$L : y = -2x + \frac{1}{5}$$

- b.** The line L passes through points $(-1, 2)$ and $(1, -4)$.

$$m = \frac{-4 - 2}{1 - (-1)} = -\frac{6}{2} = -3, \quad y - 2 = -3(x + 1)$$

$$L : y = -3x - 3 + 2 = -3x - 1$$

- c.** The line L passes through the point $(3, 1)$ and is parallel to the line : $y = -4x + 1$.

$$m = -4, \quad y - 1 = -4(x - 3)$$

$$L : y = -4x + 12 + 1 = -4x + 13$$

- d.** The line L has the y -intercept -3 and is perpendicular to the line : $2x + 5y = 1$.

The given line can be written as: $y = -\frac{2}{5}x + \frac{1}{5}$ and its slope is $m_1 = -\frac{2}{5}$. Then $m_2 = \frac{5}{2}$.

$$L : y = \frac{5}{2}x - 3$$

- e.** The line L passes through points $(-2, 2)$ and $(2, 2)$.

Since these two points have the same y value, it is a horizontal line: $y = 2$.

- f.** The line L passes through points $(-2, 2)$ and $(-2, 12)$.

Since these two points have the same x value, it is a vertical line $x = -2$.

- 4.** Each Sunday a newspaper agency sells x copies of a newspaper for \$1.00 per copy. The cost to the agency of each newspaper is \$0.60. The agency pays a fixed cost for storage, delivery, and so on, of \$150 per Sunday. Write an equation that relates the profit P , in dollars, to the number x of copies sold. What is the profit to the agency if 1500 copies are sold?

$$P = (1.00 - 0.6)x - 150 = 0.4x - 150.0$$

$$P(1500) = 0.4(1500) - 150 = 450 \text{ dollars}$$

- 5.** The relationship between Celsius ($^{\circ}C$) and Fahrenheit ($^{\circ}F$) degrees for measuring temperature is linear. Find an equation relating $^{\circ}C$ and $^{\circ}F$ if $0^{\circ}C$ corresponds to $32^{\circ}F$ and $100^{\circ}C$ corresponds to $212^{\circ}F$. Use the equation to find the Celsius measure of $70^{\circ}F$.

$$m = \frac{100 - 0}{212 - 32} = \frac{5}{9}, \quad C - 0 = \frac{5}{9}(F - 32), \quad C = \frac{5}{9}(F - 32), \quad C(70) = \frac{5}{9}(70 - 32) = 21.111C^{\circ}$$