

Lesson 1.2.3

1-98. See below:

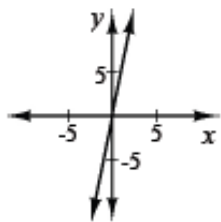
- x and y represent all of the possible inputs and outputs for the function, while m and b represent constants, which can be changed to create new functions.
- m determines the steepness of the line and is commonly referred to as slope, b determines the value of the function when x is equal to zero, and the point $(0, b)$ is the y -intercept of the graph
- Variables represent inputs and outputs, while parameters represent constants. Changing parameters changes the function, but for each function, the variables must be present.
- They are all linear functions.

1-99. Sample answers:

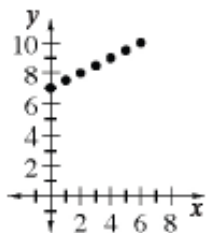
- four parallel lines with slopes of $-\frac{1}{2}$ and different y -intercepts
- four lines each with y -intercept $(0, -3)$, two with decreasing slopes and two with increasing slopes.

1-100. See below:

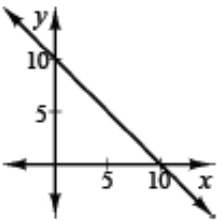
- linear, graph shown below, $y = 5x$



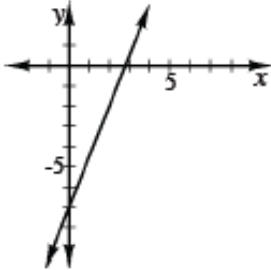
- linear (but discrete), graph shown below, $y = 0.5x + 7$



- linear, graph shown below, $y = -x + 10$



- d. nonlinear, as x goes up, y goes down but the product xy remains constant
- e. nonlinear, the output doubles as the input goes up one
- f. linear, graph shown below, $y = 2.5x - 7$

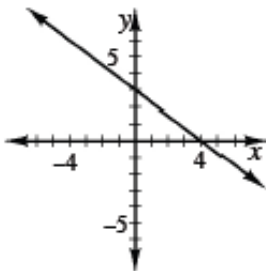


1-101. Answers vary.

1-102. Yes. It is $y = -2.5x + 3$. A possible justification could be that the change in y per unit change in x is constant. Students might think of this as a “growth ratio,” or they might name it slope.



1-104. $m = -\frac{3}{4}$, $(4, 0)$, $(0, 3)$, graph shown below.



1-105. $y = \frac{3}{2}x - 3$

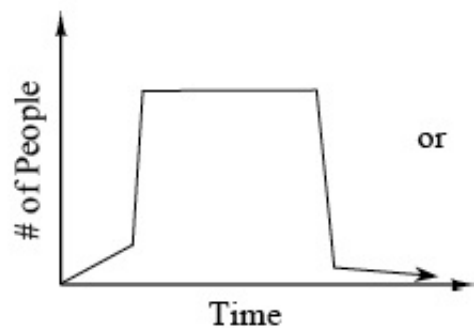
1-106. See below:

a. $x = \frac{-3 \pm \sqrt{21}}{2} \approx -3.79, 0.79$

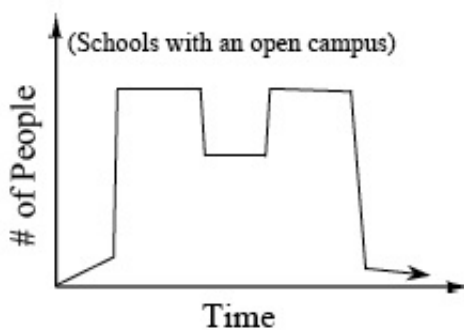
b. $x = \frac{7 \pm \sqrt{193}}{6} \approx 3.48, -1.15$

1-107. \$12.00

1-108. Sample graphs below.



or



1-109. See below:

a. $D: -3 \leq x < 3; R: y = -2, 1, 3$

b. $D: x = 2; R: -\infty < y < \infty$

c. $D: x \geq -2; R: -\infty < y < \infty$

1-110. See below:

a. 1, 2, 3, 4, 5, or 6

b. $\frac{1}{6}$

c. $\frac{4}{6} = \frac{2}{3}$