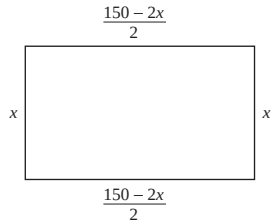
127.



Verbal model: $\boxed{\text{Perimeter}} = 2\boxed{\text{Length}} + 2\boxed{\text{Width}}$

$150 = 2\text{Length} + 2x$

$\frac{150 - 2x}{2} = \text{Length}$

$75 - x = \text{Length}$

Verbal model: $\boxed{\text{Area}} = \boxed{\text{Length}} \cdot \boxed{\text{Width}}$

Labels: Area $= A(x)$

Length $= 75 - x$

Width $= x$

Function: $A(x) = (75 - x)x$

Domain: $0 < x < \frac{75}{2}$

129. (a) $v = -32(2) + 80$

$v = -64 + 80$

$v = 16$ feet per second

(b) $0 = -32t + 80$

$32t = 80$

$t = \frac{80}{32}$

$t = \frac{5}{2}$ seconds

(c) $v = -32(3) + 80$

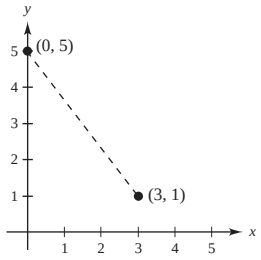
$v = -96 + 80$

$v = -16$ feet per second

Chapter Test for Chapter 2

1. (x, y) lies in Quadrant IV if $x > 0$ and $y < 0$.

2. $d = \sqrt{(0 - 3)^2 + (5 - 1)^2} = \sqrt{9 + 16} = \sqrt{25} = 5$

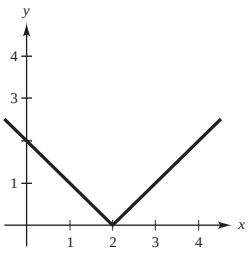


3. (a) $y = -3(0 + 1) = -3$ $(0, -3)$; y-intercept

(b) $0 = -3(x + 1)$

$x = -1$, $(-1, 0)$; x-intercept

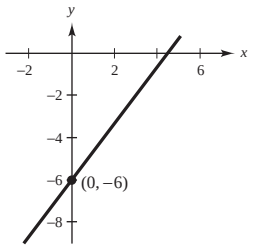
4.



5. (a) $m = \dfrac{3-7}{2+4} = -\dfrac{4}{6} = -\dfrac{2}{3}$

(b) $m = \dfrac{6+2}{3-3} = \dfrac{8}{0} =$ undefined

6.



7. $2x + 5y = 10$

$2(0) + 5y = 10$

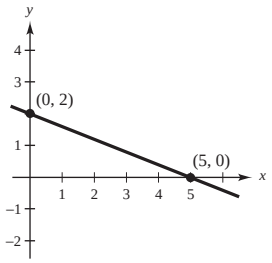
$5y = 10$

$y = 2 \quad (0, 2)$

$2x + 5(0) = 10$

$2x = 10$

$x = 5 \quad (5, 0)$



8. $5x + 3y - 9 = 0$

$3y = -5x + 9$

$y = \dfrac{-5}{3}x + 3$

$m = \dfrac{3}{5}$

9. $m = \dfrac{10+15}{75-25} = \dfrac{25}{50} = \dfrac{1}{2}$

$y - 10 = \dfrac{1}{2}(x - 75)$

$y - 10 = \dfrac{1}{2}x - \dfrac{75}{2}$

$2y - 20 = x - 75$

$x - 2y - 55 = 0$

10. $y - (-4) = -2(x - 2)$

$y + 4 = -2x + 4$

$2x + y = 0$

11. $x = -2$

$x + 2 = 0$

12. No, $y^2(4 - x) = x^3$ is not a function of x, because the graph does not pass the Vertical Line Test.

13. (a) The relation is a function because each x number is paired with exactly one y number.

(b) The relation is not a function because 0 is paired with two numbers, 0 and -4.

14. (a) $g(2) = \dfrac{2}{2-3} = -2$

(b) $g\left(\dfrac{7}{2}\right) = \dfrac{\frac{7}{2}}{\frac{7}{2} - 3} = \dfrac{7}{7-6} = 7$

(c) $g(x+2) = \dfrac{x+2}{(x+2)-3} = \dfrac{x+2}{x-1}$

15. (a) $h(t) = \sqrt{9-t}$

$9 - t \geq 0$

$-t \geq -9$

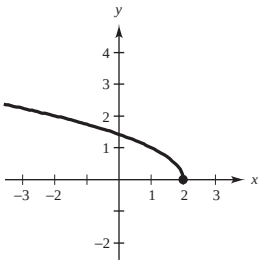
$t \leq 9$

Domain: $t \leq 9$ or $(-\infty, 9]$

(b) $f(x) = \dfrac{x+1}{x-4}$

Domain: $x \neq 4$

16.



17. $g(x) = -(x - 2)^2 + 1$ is a reflection in the x-axis, horizontal shift 2 units to the right and a vertical shift 1 unit upward.

18. (0, \$26,000), (4, \$10,000)

$$m = \frac{10{,}000 - 26{,}000}{4 - 0} = \frac{-16{,}000}{4} = -4000$$

$$V - 26{,}000 = -4000(t - 0)$$

$$V = -4000t + 26{,}000$$

$$16{,}000 = -4000t + 26{,}000$$

$$-10{,}000 = -4000t$$

$$\frac{-10{,}000}{-4000} = t$$

$$2.5 = \frac{5}{2} = t$$

19. (a) $y = |x - 2|$

(b) $y = |x| - 2$

(c) $y = -|x| + 2$ or $2 - |x|$