

Math 150 Week-in-Review 3 Answer Key

1. (a) Not a function
(b) Is a function
(c) Is a function
2. (a) $(-\infty, 9)$
(b) $(-\infty, -7) \cup (-7, -2] \cup [8, \infty)$
3. (a) See Full Solutions
(b) Domain: $(-\infty, \infty)$; Range: $[0, 1] \cup [3, \infty)$
(c) Increasing on $(0, 1) \cup (1, \infty)$; Decreasing on $(-\infty, -1) \cup (-1, 0)$
4.
$$P(x) = \begin{cases} 2x & 0 \leq x \leq 10 \\ 1.50x & 10 < x \leq 30 \\ 1.50x + .25(x - 30) & x > 30 \end{cases}$$
5. (a) $\frac{1}{5}$
(b) $6 + h$
(c) $\frac{-5}{(a-4)(a+h-4)}$
6. (a) 50 ft/s
(b) 46 ft/s
(c) 70 ft/s
7. See Full Solutions for Graphs
 - (a) Shift left 1, vertically stretch by a factor of 2
 - (b) Horizontally shrink by a factor of $\frac{1}{2}$, reflect across the y -axis, shift down 3.
 - (c) Shift right 3, reflect across the x -axis
 - (d) Shift up 2, vertically shrink by a factor of $\frac{1}{2}$
8. (a) $g(x) = 3(x + 4)^5 - 5$
(b) $g(x) = -(\sqrt[3]{\frac{1}{6}x} + 2)$
(c) $g(x) = \frac{1}{8}f(-3x)$
(d) $g(x) = 2(-f(x - 9) - 7)$
9. (a) Odd
(b) Even
(c) Neither

10. (a) $f(x) = -3(x + 3)^2 + 5$
 Vertex: $(-3, 5)$
 x -intercepts: $-3 \pm \frac{\sqrt{15}}{3}$
 y -intercept: -22
 Maximum value: $f(-3) = 5$ (Maximum value is 5 and it occurs at $x = -3$)
- (b) $f(x) = 5(x - 4)^2 - 2$
 Vertex: $(4, -2)$
 x -intercepts: $4 \pm \frac{\sqrt{10}}{5}$
 y -intercept: 78
 Minimum value: $f(4) = -2$ (Minimum value is -2 and it occurs at $x = 4$)
11. (a) Minimum value: $f(-\frac{3}{5}) = \frac{11}{5}$ (Minimum value is $\frac{11}{5}$ and it occurs at $x = -\frac{3}{5}$)
 Increasing on $(-\frac{3}{5}, \infty)$
 Decreasing on $(-\infty, -\frac{3}{5})$
 Range: $[\frac{11}{5}, \infty)$
- (b) Maximum value: $f(\frac{4}{3}) = \frac{10}{3}$ (Maximum value is $\frac{10}{3}$ and it occurs at $x = \frac{4}{3}$)
 Increasing on $(-\infty, \frac{4}{3})$
 Decreasing on $(\frac{4}{3}, \infty)$
 Range: $(-\infty, \frac{10}{3}]$
12. $f(x) = 4(x - 5)^2 - 8$