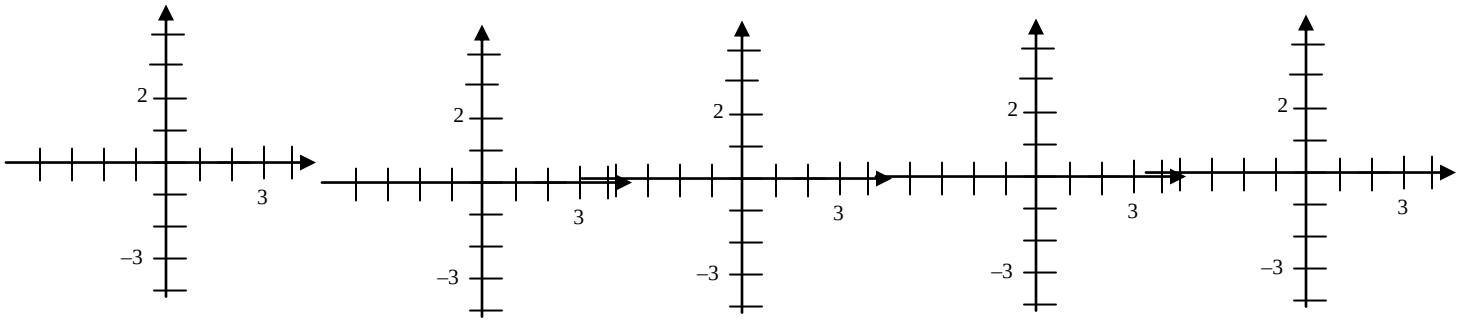
Precalculus Chapter 1 Test Review

1. Graph each equation:

a) $y = (x-3)^2 + 1$ b) $y = |x-4| - 1$ c) $y = \sqrt{x+1} - 3$ d) $y = -x + 4$ e) $y = (x+2)^3$



2. Find an equation of the line that passes through (15, 1) and is

a) parallel to the line $x - 3y = 1$ b) perpendicular to the line $5x + 3y = 5$

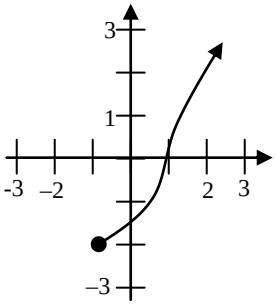
3. Determine which equation(s) represents y as a function of x.

(a) $y = |x|$ (b) $3x + 2y = 9$ (c) $y = (x-2)^2 - 2$

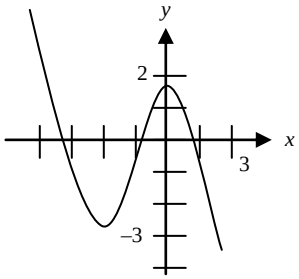
(d) $y^2 = 5x - 2$ (e) $|y| = 2x - 1$

4. Given $f(x) = x^2 + 2x - 3$, find $f(x+3) - f(3)$.

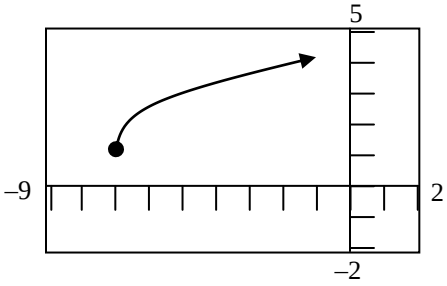
5. Find the range of the function:.



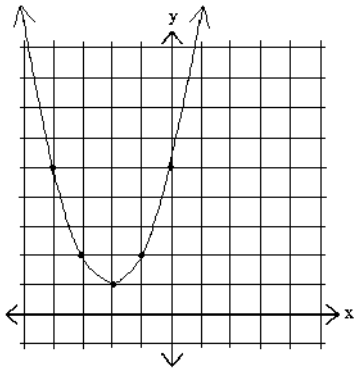
6. Determine the open intervals in which the function is increasing, decreasing, or constant.



7. The graph at the right is a transformation of the graph of $f(x) = \sqrt{x}$. Find an equation for the function.



8. Use the following graph to find: f(-4), f(-2), f(-1), and f(0).



9. Given $f(x) = 2x^2 - 5$ and $g(x) = 3 - x$, find $(f \circ g)(x)$.

10. Algebraically, determine if the functions are inverses of each other.

$$f(x) = \frac{2x+5}{3} \quad g(x) = \frac{3x-5}{2}$$

11. a) Given $f(x) = \frac{1}{2}x^2 + 3,\ x \geq 0$ find $f^{-1}(x)$.

b) Given $g(x) = (x-4)^3$, find the inverse of the function.

12. If $f(x) = x^2 + 6x + 9$, then find $\frac{f(x+a) - f(a)}{x}, x \neq 0$.

13. For the function $f(x) = x^2 + 5x - 10$, find all values of x for which $f(x) = 4$.

14. Determine the domain of the function: a) $f(x) = \frac{8}{x^2 - 9}$ b) $f(x) = \sqrt{5-x}$

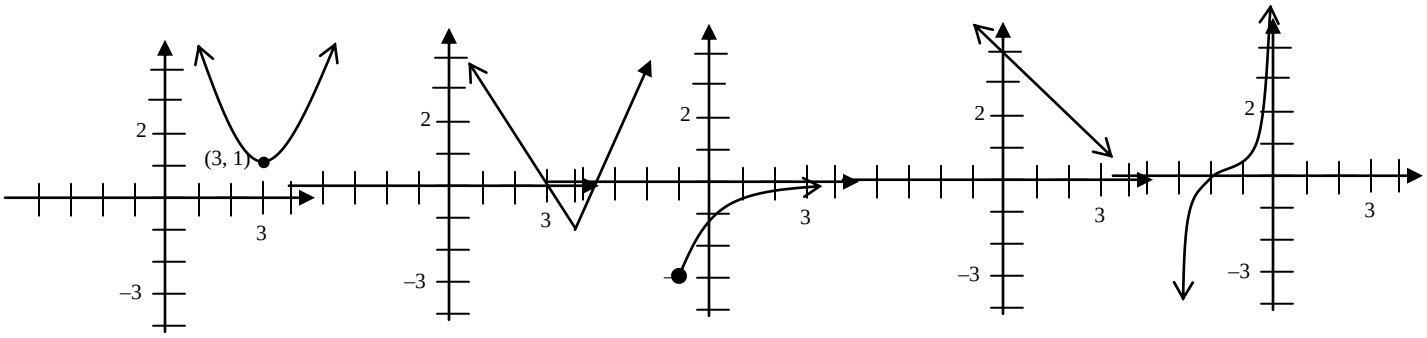
15. Graph: $f(x) = \begin{cases} (x-3)^2, & x \leq 4 \\ -x, & x > 4 \end{cases}$

16. Given $f(x) = x^2$ and $g(x) = 2x - 7$, find the following: $f + g$, fg, and $(f - g)(5)$.

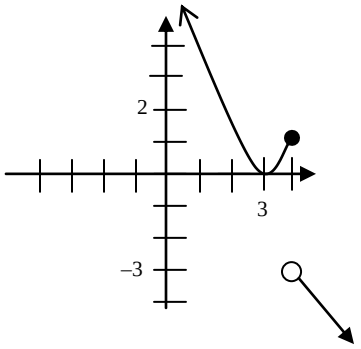
Precalculus Chapter 1 Test Review Solutions

1. Graph each equation:

a) $y=(x-3)^2+1$ b) $y=|x-4|-1$ c) $y=\sqrt{x+1}-3$ d) $y=-x+4$ e) $y=(x+2)^3$



2. a) $y=\frac{1}{3}x-4$ b) $y=\frac{3}{5}x-8$
3. a, b, and c
4. $x^2 + 8x$
5. $y \geq -2$
6. Increasing: (–2, 0); Decreasing: $(-\infty, -2)$, $(0, \infty)$
7. $f(x)=\sqrt{x+7}+1$
8. f(-4) = 5, f(-2) = 1, f(-1) = 2, f(0) = 5
9. $2x^2 - 12x + 13$
10. $f(g(x))=x$, so yes.
11. a) $f^{-1}(x)=\sqrt{2x-6}$ b) $g^{-1}(x)=\sqrt[3]{x}+4$
12. x + 2a + 6
13. x = -7, x = 2
14. a) Domain: ARN except ± 3 b) all real numbers less than or equal to 5
15.



16. $f + g = x^2 + 2x - 7$; $fg = 2x^3 - 7x^2$; $(f - g)(5) = 22$