Precalculus-G11-Ch2-Test

Indicate the answer choice that best completes the statement or answers the question.

Use the given zero to find all zeros of each function.

1. $g(x) = x^5 + 11x^4 + 5x^3 - 345x^2 - 1476x - 1836; -4 - i$

    a. $-6, -3, 6, -4 + i, -4 - i$ b. $-4 + i, -4 - i$

    c. $-6, -3, 6, -4 + i$ d. $-6, -3, 6, -4 - i$

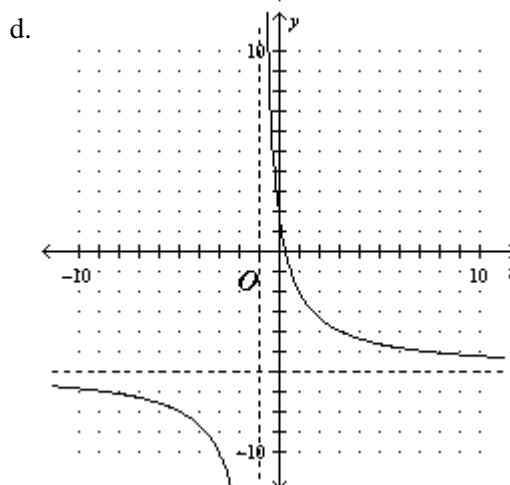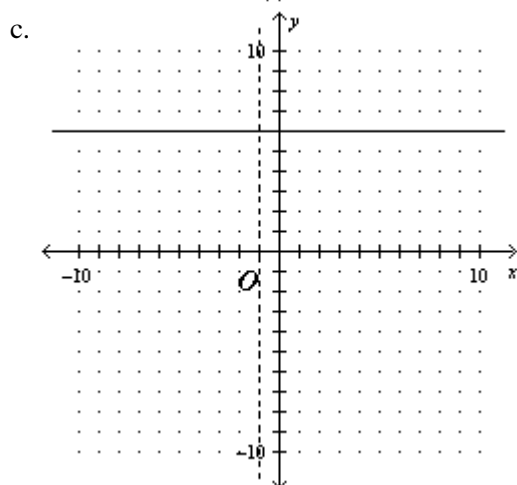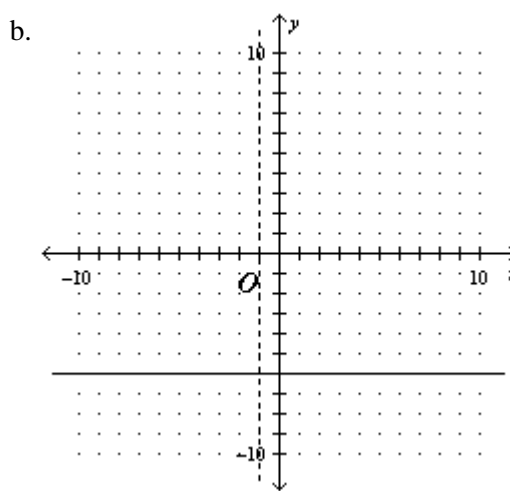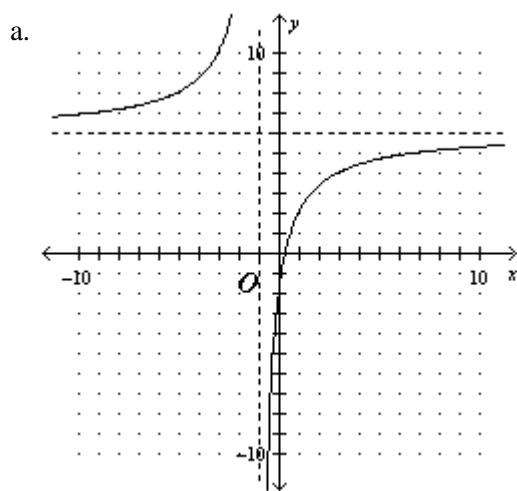2. Use the end behavior of the graph to solve $3x^3 + 9x^2 - 12x < 0$.

    a. $\left(0, 1\right)$ b. $\left(-4, 0\right)$

    c. $\left(-4, 0\right)$ or $\left(1, \infty\right)$ d. $\left(-\infty, -4\right)$ or $\left(0, 1\right)$

3. Solve $\log_6 x = 2$

    a. 36   b. 12

    c. 6   d. 64

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4. Which is a graph of $f(x) = \dfrac{6x - 2}{x + 1}$, with any vertical or horizontal asymptotes indicated by dashed lines?

a.

b.

c.

d.

Expand each expression.

5. $\log_2 [(2x)^3(x + 1)]$

    a. $3 + 3 \log_2 x \times \log_2 (x + 1)$

    b. $3 + 3 \log_2 (2x + 1)$

    c. $3 + 2 \log_3 x + \log_2 (x + 1)$

    d. $3 + 3 \log_2 x + \log_2 (x + 1)$

6. $\dfrac{3x - 1}{4} - \dfrac{x - 5}{5} > -2$

    a. $x > 0$ or $x < -5$ b. $x < -5$
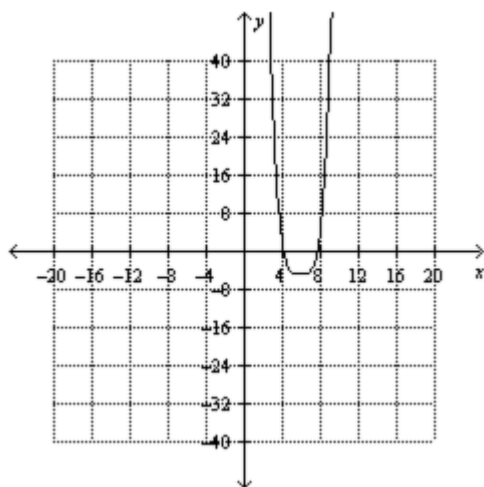
    c. $x > -5$ d. $x < 0$ or $x > 5$

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7. Determine which consecutive integers do *not* have a real zero of $f(x) = x^3 + 9x^2 + 8x - 5$ between them.
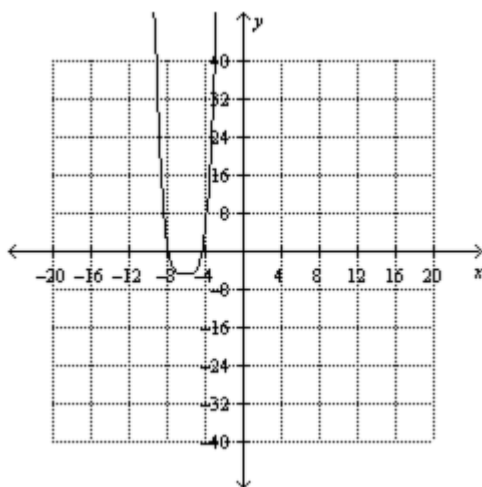
    a. $(-8, -7)$ b. $(4, 5)$

    c. $(0, 1)$ d. $(-2, -1)$

8. Graph $f(x) = \frac{1}{2}(x - 6)^4 - 5$.

    a.

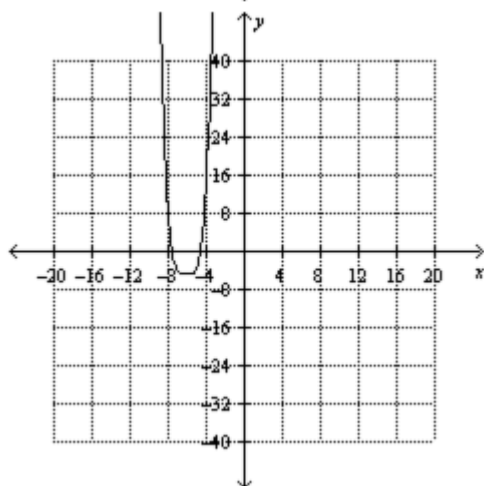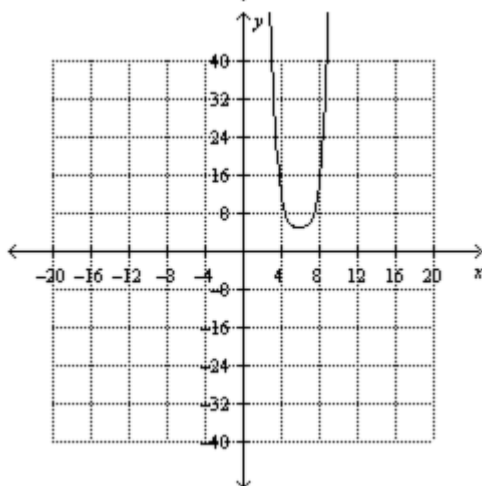   b.

    c.

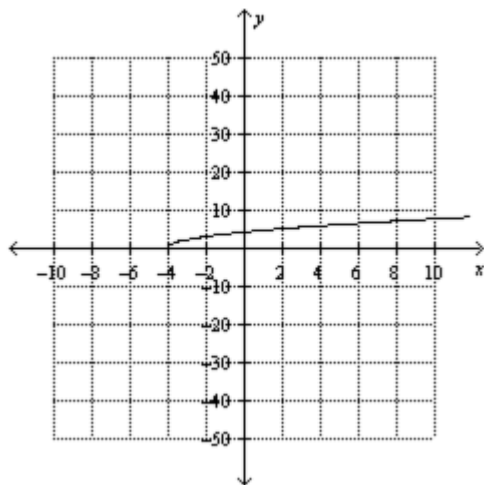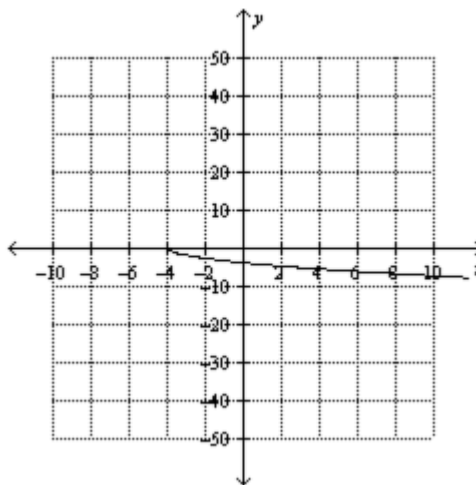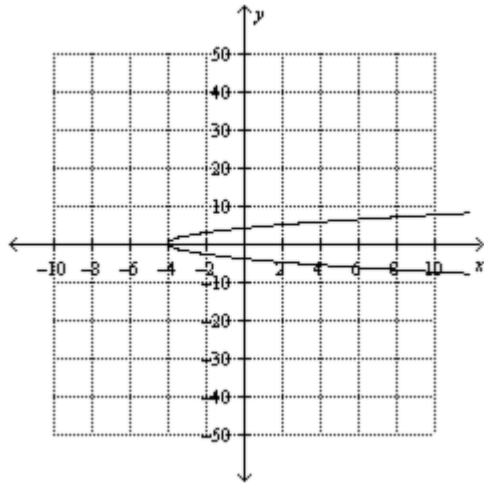   d.
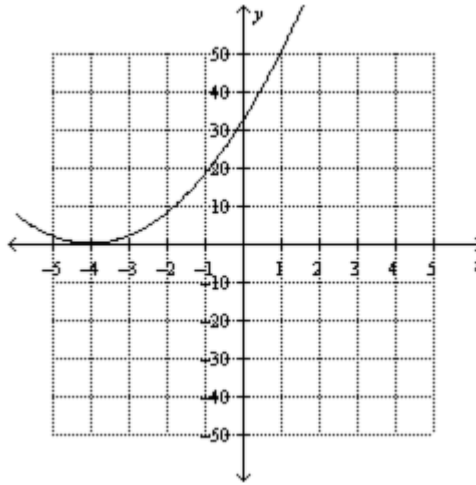
Precalculus-G11-Ch2-Test

9. Graph $f(x) = 2\sqrt{x+4}$.

a.

b.

c.

d.

10. Use the end behavior of the graph to solve $3x^3 + 4x^2 - 4x < 0$.

a. $\left(0, \dfrac{2}{3}\right)$

b. $\left(-2, 0\right)$

c. $\left(-2, 0\right)$ or $\left(\dfrac{2}{3}, \infty\right)$

d. $\left(-\infty, -2\right)$ or $\left(0, \dfrac{2}{3}\right)$

11. Determine the equation whose roots are –3, 3, and 3.

a. $x^3 + 3x^2 - 9x + 27 = 0$

b. $x^3 - 3x^2 - 9x + 27 = 0$

c. $x^3 - 9x^2 - 9x + 27 = 0$

d. $x^3 - 9x^2 + 27x + 27 = 0$
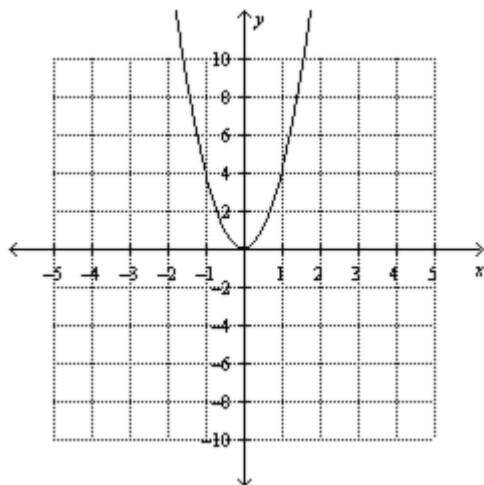
Precalculus-G11-Ch2-Test
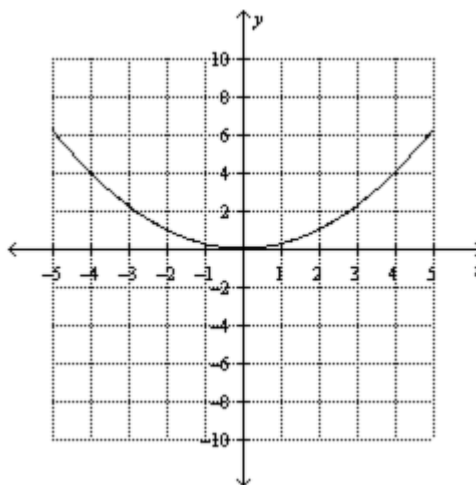
12. Solve.

$$\frac{x+3}{x-5} = \frac{x+7}{x-9}$$

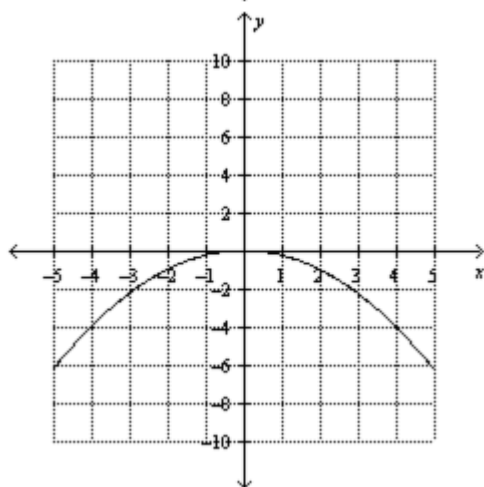   a. 1   b. 8

    c. –5   d. 2

13. Graph $h(x) = -4x^2$

    a.
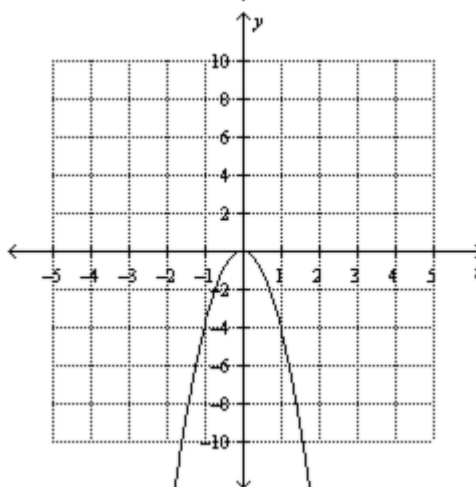

    b.

    c.

    d.

Write each decimal degree measure in DMS form and each DMS measure in decimal degree form to the nearest thousandth.

14. 32 28′ 10″

    a. 32.469°

    b. 32.281°

    c. 32.1651°

    d. 32°

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Sketch and analyze the graph of each function. Describe its domain, range, intercepts, asymptotes, end behavior, and where the function is increasing or decreasing.
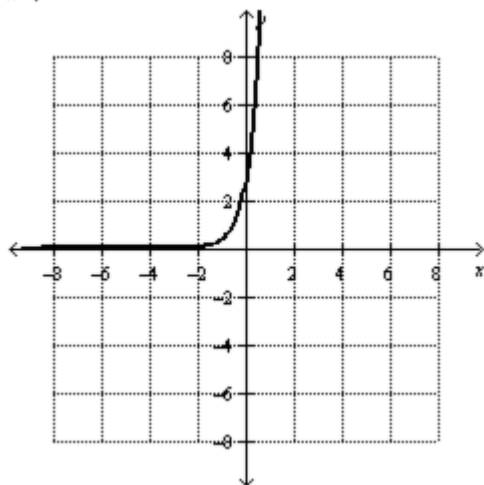
15. $g(x) = e^{2x + 1}$

   a. D = (–∞, ∞); R = (0, ∞);
      y-intercept: (0, e) or (0, 2.72); x-intercept: none;
      asymptote: x-axis; end behavior: $\lim\limits_{x \to -\infty} f(x) = 0$ and

      $\lim\limits_{x \to \infty} f(x) = \infty$; increasing: (–∞, ∞)

   b. D = (–∞, ∞); R = (0, ∞);
      y-intercept: (0, 0.3); x-intercept: none; asymptote:
      x-axis; end behavior: $\lim\limits_{x \to -\infty} f(x) = 0$ and
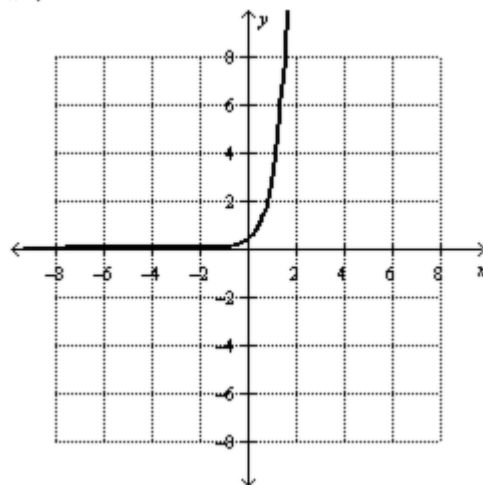
      $\lim\limits_{x \to \infty} f(x) = \infty$; increasing: (–∞, ∞)

   c. D = (–∞, ∞); R = (–∞, ∞);
      y-intercept: (0, 2); x-intercept: none; asymptote: x =
      1; end behavior: $\lim\limits_{x \to -\infty} f(x) = 1$ and $\lim\limits_{x \to \infty} f(x) = \infty$;

      increasing: (–∞, ∞)
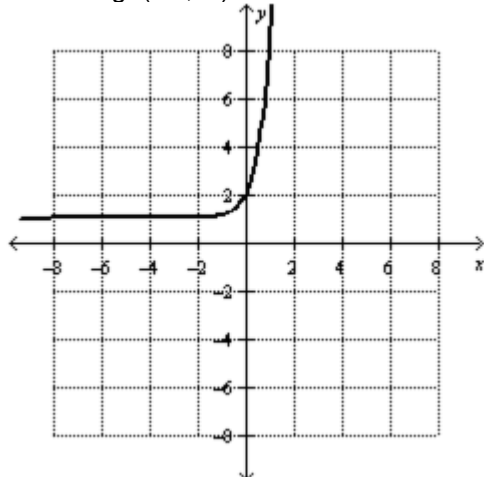
   d. D = (–∞, ∞); R = (0, ∞);
      y-intercept: (0, e) or (0, 2.72); x-intercept: none;
      asymptote: x-axis; end behavior: $\lim\limits_{x \to -\infty} f(x) = \infty$

      and $\lim\limits_{x \to \infty} f(x) = 0$; decreasing: (∞, –∞)
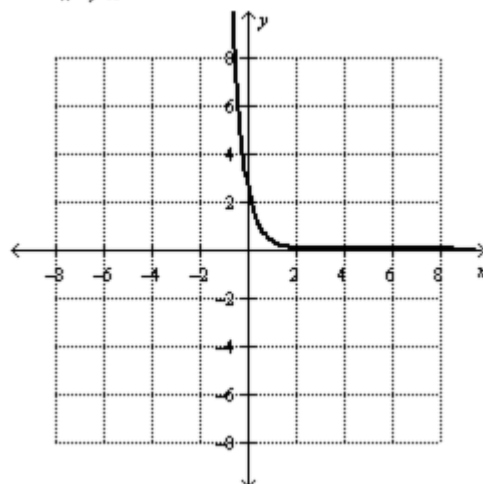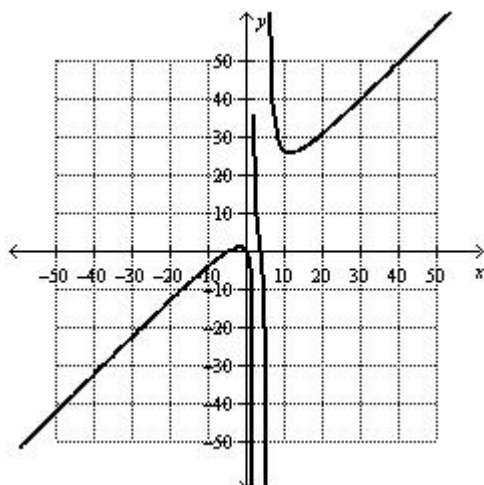
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Find each $f(c)$ using synthetic substitution.

16. $f(x) = 2x^5 + 10x^4 + 4x^3 - x^2 - 2x + 6; c = -5$
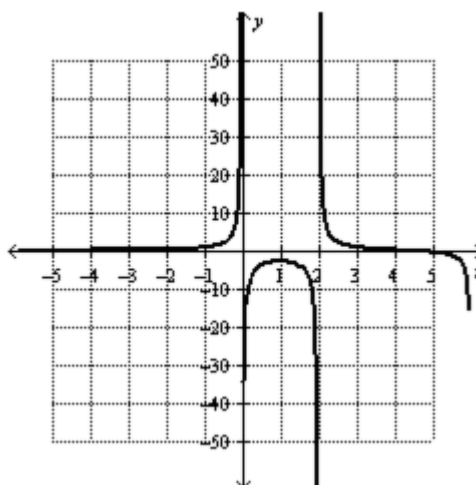
    a. 121   b. 11,991

    c. −509   d. 12,971

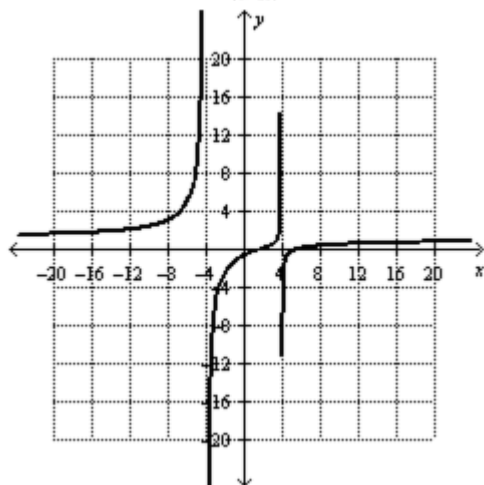17. Graph $f(x) = \dfrac{x(x-4)(x+4)}{x^2 - 8x + 12}$
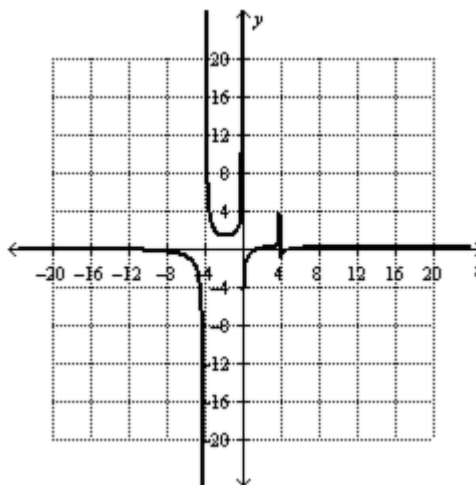
a.

b.

c.

d.

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18. Find the domain of and the equations of any vertical or horizontal asymptotes for $g(x) = \dfrac{x^2 - x - 6}{x - 3}$.

    a. $D = \{x \mid x \neq 3, x \in P\}$; vertical asymptote: $x = -2$

    b. $D = \{x \mid x \neq -3, x \in P\}$; vertical asymptote: $x = -2$

    c. $D = \{x \mid x \neq -3, x \in P\}$; vertical asymptote: $x = 2$

    d. $D = \{x \mid x \neq 3, x \in P\}$; vertical asymptote: $x = 2$

Use the graph of f to describe the transformation that results in the graph of g. Then sketch the graphs of g and f.

19. $f(x) = \left(\dfrac{1}{3}\right)^x$; $g(x) = \left(\dfrac{1}{3}\right)^{x-2} - 4$

    a. $g(x)$ is the graph of $f(x)$ translated 4 unit(s) to the right and 2 unit(s) down.

    b. $g(x)$ is the graph of $f(x)$ translated 2 unit(s) to the right and 4 unit(s) down.

    c. $g(x)$ is the graph of $f(x)$ translated 2 unit(s) to the left and 4 unit(s) down.

    d. $g(x)$ is the graph of $f(x)$ translated 4 unit(s) to the left and 2 unit(s) down.

Solve each inequality. Round to the nearest hundredth.

20. $3x^2 - 4 \leq 6 - 5x$

    a. $-2.84 \leq x \leq 1.17$ b. no solution

    c. infinite solutions   d. $x \leq -2.84$ or $x \geq 1.17$

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