

1. Find the domain of f .

$$f(x) = \frac{12}{10 - x}$$

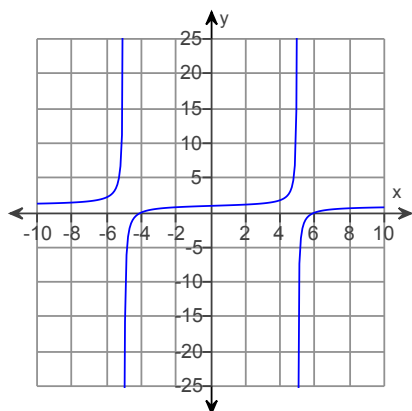
- A. $\{x \mid x \neq 12\}$
 B. $\{x \mid x \neq \pm 12\}$
 C. $\{x \mid x \neq 10\}$
 D. $\{x \mid x \neq \pm 10\}$

2. Find the domain of f .

$$f(x) = \frac{x - 8}{x^2 + 7x}$$

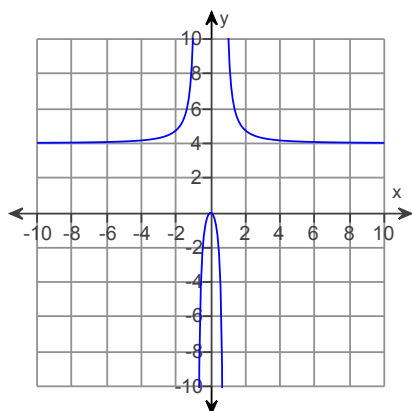
- A. $\{x \mid x \neq 8\}$
 B. $\{x \mid x \neq 0, x \neq -7\}$
 C. $\{x \mid x \neq 7\}$
 D. $\{x \mid x \neq -7\}$

3. Identify any vertical asymptotes in the graph.



- A. $x = 5, x = -5$
 B. None
 C. $x = -6, x = 4$
 D. $x = 6, x = -4$

4. Identify any horizontal asymptotes in the graph.



- A. $y = \sqrt{5}$
 B. $y = 5$
 C. None
 D. $y = 4$

5. Find any vertical asymptotes.

$$f(x) = \frac{x - 1}{x^2 - 16}$$

- A. $x = 1$
- B. $x = -4$
- C. $x = 4$
- D. $x = 4, x = -4$

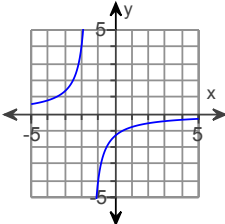
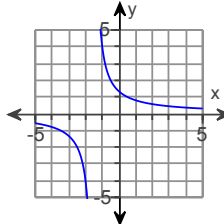
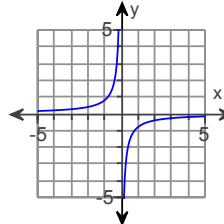
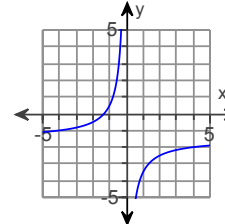
6. Find the horizontal asymptote of the given function.

$$h(x) = \frac{2x^2}{2x^2 - 3}$$

- A. $y = 1$
- B. $y = \sqrt{3}$
- C. None
- D. $y = 3$

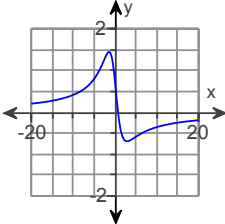
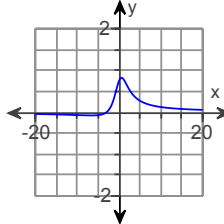
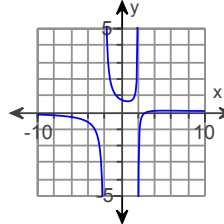
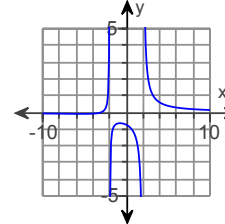
7. Match $f(x)$ with its graph without using a calculator.

$$f(x) = \frac{4}{-3 - 2x}$$

- A. 
- B. 
- C. 
- D. 

8. Match $f(x)$ with its graph without using a calculator.

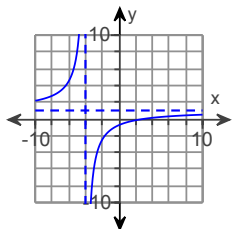
$$f(x) = \frac{x + 3}{x^2 + 4}$$

- A. 
- B. 
- C. 
- D. 

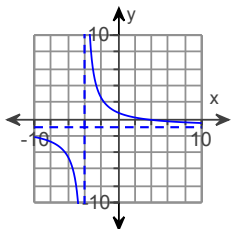
9. Sketch the graph of the rational function.

$$f(x) = \frac{x-3}{x+4}$$

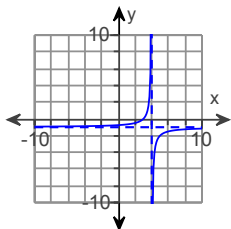
A.



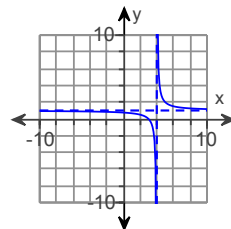
B.



C.



D.



10. Solve the equation.

$$\frac{x-2}{x+7} = 5$$

A. $\frac{11}{2}$

B. $-\frac{37}{4}$

C. $-\frac{33}{4}$

D. $\frac{37}{6}$

11. Solve the rational equation.

$$1 + \frac{1}{x} = \frac{20}{x^2}$$

A. 5, 4

B. -5, 4

C. 5, -4

D. $-\frac{1}{5}, \frac{1}{4}$

12. Solve the rational equation.

$$\frac{5-x}{x} + \frac{3}{4} = \frac{7}{x}$$

A. $\sqrt{\frac{29}{20}}$

B. 8

C. -8

D. -4

13. Solve the polynomial inequality.

$$(x + 10)(x + 9)(x + 2) < 0$$

- A. $(-10, -9) \cup (-2, \infty)$
- B. $(-\infty, -9)$
- C. $(-2, \infty)$
- D. $(-\infty, -10) \cup (-9, -2)$

14. Solve the polynomial inequality.

$$(2x + 7)(x - 7)(3x - 4) \leq 0$$

- A. $(-\infty, -\frac{7}{2}] \cup [\frac{4}{3}, 7]$
- B. $(-\infty, -\frac{7}{2}) \cup (\frac{4}{3}, 7)$
- C. $(-\frac{7}{2}, \frac{4}{3}) \cup (7, \infty)$
- D. $[-\frac{7}{2}, \frac{4}{3}] \cup [7, \infty)$

15. Solve the rational inequality.

$$\frac{-5}{-7x - 6} > 0$$

- A. $(-\frac{6}{7}, \infty)$
- B. $(0, \infty)$
- C. $(-\infty, \frac{6}{7})$
- D. $(-\infty, -\frac{7}{6})$

16. Solve the rational inequality.

$$\frac{5}{x - 9} > \frac{4}{x - 9}$$

- A. No solution
- B. $(9, \infty)$
- C. $(-\infty, 9)$
- D. $(-\infty, \infty)$

17. Evaluate the expression by hand.

$$8^{1/3}$$

- A. 48
 - B. 16
 - C. 6
 - D. 2
-

18. Evaluate the expression by hand.

$$625^{5/4}$$

- A. 390,625
 - B. 1,953,125
 - C. 78,125
 - D. 3,125
-

19. Evaluate the expression by hand.

$$\left(\frac{1}{9}\right)^{-1/2} + \left(\frac{1}{25}\right)^{-3/2}$$

- A. $-\frac{128}{375}$
 - B. 128
 - C. $-\frac{26}{225}$
 - D. 8
-

20. Use positive rational exponents to rewrite the expression.

$$\sqrt[5]{x^6}$$

- A. $5x^6$
 - B. $x^{5/6}$
 - C. $x^{6/5}$
 - D. $6x^5$
-

21. Use radical notation to rewrite.

$$a^{-1/2} b^{3/5}$$

A. $\frac{\sqrt{a}}{\sqrt[3]{b^5}}$

B. $\frac{\sqrt[5]{b^3}}{\sqrt{a}}$

C. $\frac{\sqrt[3]{b^5}}{\sqrt{a}}$

D. $\frac{\sqrt{a}}{\sqrt[5]{b^3}}$

22. Solve the equation.

$$\sqrt{2k+1} = 3$$

A. 8

B. 4

C. 2

D. -4

23. Solve the equation.

$$\sqrt{2x+5} - \sqrt{x-2} = 3$$

A. -2

B. 2, 38

C. 2

D. 3, 8

24. Solve the equation.

$$\sqrt[3]{3x-1} = \sqrt[3]{4x+6}$$

A. 7

B. $-\frac{7}{3}$

C. 5

D. -7

25. Use $f(x) = x^2$ and $g(x) = 2 - x$ to evaluate $(f - g)(3)$.

- A. -9
- B. 0
- C. 4
- D. 10

26. Find $(fg)(x)$.

$$f(x) = 6x + 5; g(x) = 2x^2$$

- A. $12x^2 + 10x$
- B. $12x + 10$
- C. $2x^2 + 6x + 5$
- D. $12x^3 + 10x^2$

27. Find $(f + g)(x)$.

$$f(x) = \sqrt{5x + 5}; g(x) = \sqrt{5x - 5}$$

- A. $x\sqrt{10}$
- B. $\sqrt{10x}$
- C. $5x$
- D. $\sqrt{5x + 5} + \sqrt{5x - 5}$

28. Find $(fg)(x)$.

$$f(x) = \sqrt{5x + 5}; g(x) = \sqrt{25x - 9}$$

- A. $(\sqrt{5x + 5})(\sqrt{25x - 9})$
- B. $(5x + 5)(5x - 3)$
- C. $(5x + 5)(25x - 9)$
- D. $(5x - 3)(\sqrt{5x + 5})$

29. Find $g(11)$ when $g(x) = -6x - 10$.

- A. 56
- B. -56
- C. -67
- D. -76

30. Find $(f \circ g)(7)$ when $f(x) = -8x - 9$ and $g(x) = -4x^2 - 8x + 5$.

- A. 785
- B. 623
- C. 1,967
- D. -16,375

31. Find $(g \circ f)(3)$ when $f(x) = 2x + 5$ and $g(x) = -\frac{2}{x}$.

- A. $\frac{11}{3}$
- B. $-\frac{22}{3}$
- C. $-\frac{2}{11}$
- D. $\frac{31}{3}$

32. Given $f(x) = -3x + 7$ and $g(x) = 2x + 3$, find $(g \circ f)(x)$.

- A. $6x + 17$
- B. $-6x + 16$
- C. $-6x - 11$
- D. $-6x + 17$

33. Find the functions f and g so that $F(x) = (f \circ g)(x)$.

$$F(x) = |9x + 3|$$

- A. $f(x) = |x|$; $g(x) = 9x + 3$
- B. $f(x) = -|x|$; $g(x) = 9x + 3$
- C. $f(x) = x$; $g(x) = 9x + 3$
- D. $f(x) = |-x|$; $g(x) = 9x - 3$

34. Find the functions f and g so that $F(x) = (f \circ g)(x)$.

$$F(x) = \sqrt{82x^2 + 4}$$

- A. $f(x) = \sqrt{82x + 4}$; $g(x) = x^2$
- B. $f(x) = \sqrt{82x^2}$; $g(x) = \sqrt{4}$
- C. $f(x) = \sqrt{x}$; $g(x) = 82x^2 + 4$
- D. $f(x) = 82x^2 + 4$; $g(x) = \sqrt{x}$

1. C. $\{x \mid x \neq 10\}$

2. B. $\{x \mid x \neq 0, x \neq -7\}$

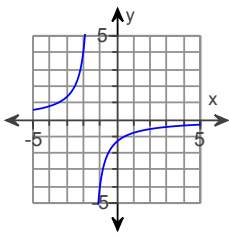
3. A. $x = 5, x = -5$

4. D. $y = 4$

5. D. $x = 4, x = -4$

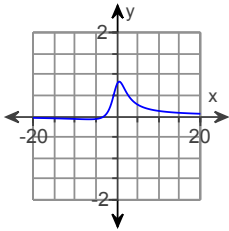
6. A. $y = 1$

7.



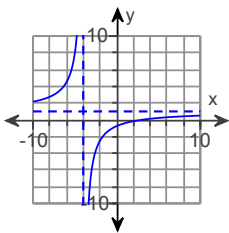
A.

8.



B.

9.



A.

10. B. $-\frac{37}{4}$

11. B. $-5, 4$

12. C. -8

13. D. $(-\infty, -10) \cup (-9, -2)$

14. A. $\left(-\infty, -\frac{7}{2}\right] \cup \left[\frac{4}{3}, 7\right]$

15. A. $\left(-\frac{6}{7}, \infty\right)$

16. B. $(9, \infty)$

17. D. 2

18. D. 3,125

19. B. 128

20. C. $x^{6/5}$

21. A. $\sqrt[5]{b^3}$
B. $\frac{\sqrt{b^3}}{\sqrt{a}}$

22. B. 4

23. B. 2, 38

24. D. -7

25. D. 10

26. D. $12x^3 + 10x^2$

27. D. $\sqrt{5x+5} + \sqrt{5x-5}$

28. A. $(\sqrt{5x+5})(\sqrt{25x-9})$

29. D. -76

30. C. 1,967

31. C. $-\frac{2}{11}$

32. D. $-6x + 17$

33. A. $f(x) = |x|$; $g(x) = 9x + 3$

34. C. $f(x) = \sqrt{x}$; $g(x) = 82x^2 + 4$
