

1. Find the domain of f .

$$f(x) = \frac{x-4}{x^2+6}$$

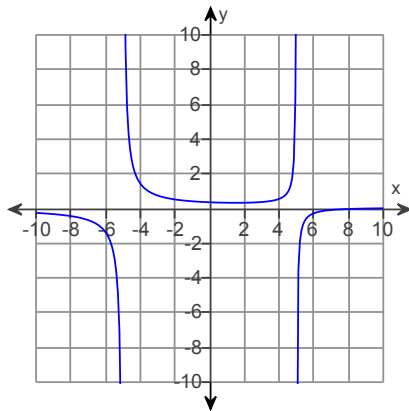
- A. $\{x \mid x \neq 6\}$
- B. $\{x \mid x \neq \pm 2\}$
- C. $\{x \mid x \neq -6\}$
- D. All real numbers

2. Find the domain of f .

$$f(x) = \frac{x-2}{(x-1)(x+4)}$$

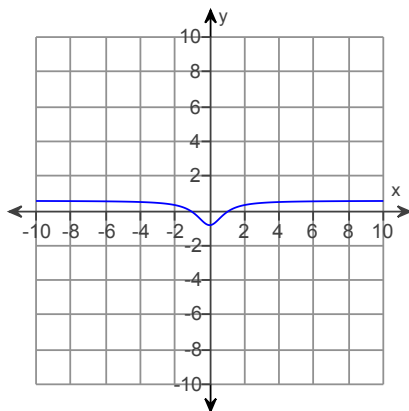
- A. $\{x \mid x \neq -2\}$
- B. $\{x \mid x \neq 1, x \neq -4\}$
- C. $\{x \mid x \neq 2\}$
- D. $\{x \mid x \neq -1, x \neq 4\}$

3. Identify any vertical asymptotes in the graph.



- A. $x=5, x=-5$
- B. $x=9$
- C. $x=-5$
- D. $x=5$

4. Identify any horizontal asymptotes in the graph.



- A. None
- B. $y=0$
- C. $y = \frac{11}{7}$
- D. $y = \frac{4}{7}$

5. Find any vertical asymptotes.

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

- A. $x = -4$
- B. None
- C. $x = 4$
- D. $x = 2, x = -2$

6. Find any vertical asymptotes.

$$g(x) = \frac{x-7}{(x-5)(x+6)}$$

- A. $x = -7$
- B. $x = 7$
- C. $x = -5, x = 6$
- D. $x = 5, x = -6$

7. Find the horizontal asymptote of the given function.

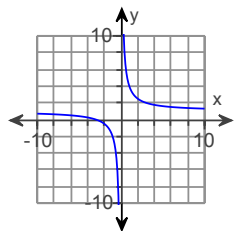
$$g(x) = \frac{x^2 + 4x - 8}{x - 8}$$

- A. $y = 5$
- B. $y = -4$
- C. $y = 8$
- D. None

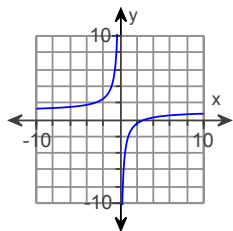
8. Match $f(x)$ with its graph without using a calculator.

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

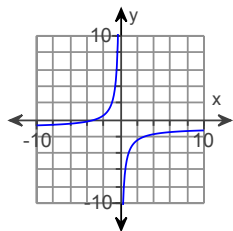
A.



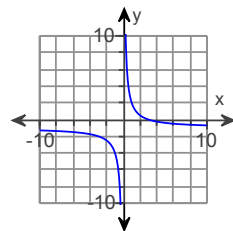
B.



C.



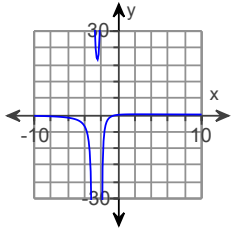
D.



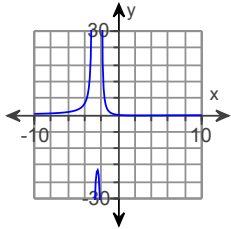
9. Sketch the graph of the rational function.

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

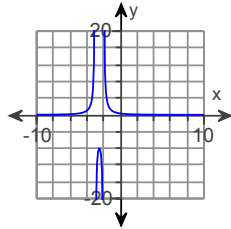
A.



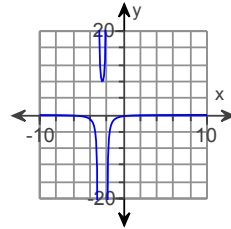
B.



C.



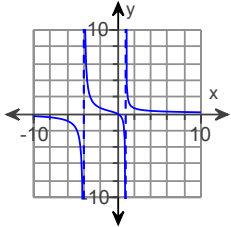
D.



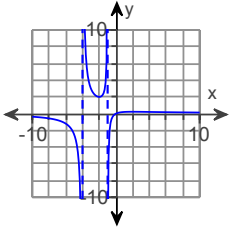
10. Sketch the graph of the rational function.

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

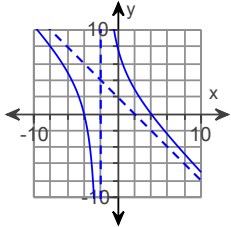
A.



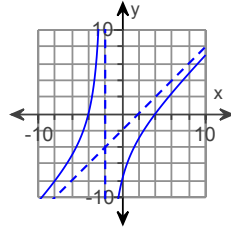
B.



C.



D.



11. Solve the equation.

$$\frac{4}{x+7} = -\frac{8}{9}$$

A. $-\frac{95}{9}$

B. $\frac{95}{8}$

C. $\frac{5}{2}$

D. $-\frac{23}{2}$

12. Solve the rational equation.

$$\frac{4}{x+3} - \frac{8}{x-3} = \frac{10}{x^2 - 9}$$

A. $\sqrt{31}$

B. 11.5

C. -11.5

D. 46

13. Solve the rational equation.

$$\frac{2}{x} = \frac{x}{5x - 12}$$

- A. 4, 6
- B. 0
- C. 0, 36
- D. $0, \frac{24}{9}$
-

14. Solve the polynomial inequality.

$$(x + 10)(x^2 - 49) > 0$$

- A. $(-10, 7)$
- B. $(-10, -7) \cup (7, \infty)$
- C. $(-\infty, 7) \cup (7, 10)$
- D. $(-\infty, -7) \cup (7, \infty)$
-

15. Solve the polynomial inequality.

$$2x^3 + 11x^2 - 23x - 14 > 0$$

- A. $\left(-7, -\frac{1}{2}\right) \cup (2, \infty)$
- B. $\left[-7, -\frac{1}{2}\right] \cup [2, \infty)$
- C. $(-\infty, -7) \cup \left(-\frac{1}{2}, 2\right)$
- D. $(-\infty, -7] \cup \left[-\frac{1}{2}, 2\right]$
-

16. Solve the rational inequality.

$$\frac{x + 13}{x + 6} < 4$$

- A. No solution
- B. $\left(-\infty, -\frac{11}{3}\right) \cup (6, \infty)$
- C. $(-\infty, -6) \cup \left(-\frac{11}{3}, \infty\right)$
- D. $\left(-6, -\frac{11}{3}\right)$
-

17. Solve the rational inequality.

$$3 + \frac{14}{x} - \frac{5}{x^2} \leq 0$$

- A. $\left[-5, \frac{1}{3}\right]$
- B. $\left[\frac{1}{3}, 5\right]$
- C. $(-\infty, -5] \cup \left[\frac{1}{3}, \infty\right)$
- D. $[-5, 0) \cup \left(0, \frac{1}{3}\right]$
-

18. Evaluate the expression by hand.

$$1,296^{1/4}$$

- A. 144
- B. 7,776
- C. 24
- D. 6
-

19. Evaluate the expression by hand.

$$243^{4/5}$$

- A. 19,683
- B. 6,561
- C. 2,187
- D. 81
-

20. Use positive rational exponents to rewrite the expression.

$$\sqrt[7]{x^3}$$

- A. $x^{1/21}$
- B. $x^{7/3}$
- C. $x^{3/21}$
- D. $x^{3/7}$
-

21. Use radical notation to rewrite.

$$a^{-1/2} b^{4/7}$$

A. $\frac{\sqrt[7]{b^4}}{\sqrt{a}}$

B. $\frac{\sqrt[4]{b^7}}{\sqrt{a}}$

C. $\frac{\sqrt{a}}{\sqrt[4]{b^7}}$

D. $\frac{\sqrt{a}}{\sqrt[7]{b^4}}$

22. Solve the equation.

$$\sqrt{4x-3} = 2x-3$$

A. 3

B. No solution

C. 1, 3

D. -3

23. Solve the equation.

$$\sqrt{3x-2} + \sqrt{11+x} = -1$$

A. 0

B. 5

C. $-\frac{5}{2}$

D. No solution

24. Use $f(x) = x - 3$ and $g(x) = x + 3$ to evaluate $(fg)(-2)$.

A. 4

B. -11

C. -5

D. 1

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

$$f(x) = 7x + 6; g(x) = 3x^2$$

- A. $\frac{7x + 6}{3x^2}$
- B. $21x^3 + 18x$
- C. $7x + 6 + 3x^2$
- D. $7x + 6 - 3x^2$
-

26. Find $(f - g)(x)$.

$$f(x) = 6x - 2; g(x) = 8x - 6$$

- A. $-2x - 8$
- B. $2x - 4$
- C. $-2x + 4$
- D. $14x - 8$
-

27. Find $(fg)(x)$.

$$f(x) = 6x - 6; g(x) = 2x + 4$$

- A. $12x^2 - 24$
- B. $12x^2 + 12x - 24$
- C. $12x^2 - 8x - 24$
- D. $8x^2 + 12x - 2$
-

28. Find $g(7)$ when $g(x) = \sqrt{2x + 9}$.

- A. $\sqrt{23}$
- B. $\sqrt{11}$
- C. 25
- D. 16
-

29. Find $(g \circ f)(-6)$ when $f(x) = 6x - 4$ and $g(x) = 7x^2 + 9x + 7$.

- A. -633
- B. 10,847
- C. -538
- D. 1,226
-

30. Find $(g \circ f)(2)$ when $f(x) = \sqrt{6x+6}$ and $g(x) = 5x^2$.

- A. $20\sqrt{90}$
- B. 90
- C. 8,100
- D. $\sqrt{126}$

31. Given $f(x) = \frac{2}{x-7}$ and $g(x) = \frac{7}{5x}$, find $(f \circ g)(x)$.

- A. $\frac{10x}{7+35x}$
- B. $\frac{2x}{7-35x}$
- C. $\frac{7x-49}{10x}$
- D. $\frac{10x}{7-35x}$

32. Given $f(x) = \frac{2}{x}$ and $g(x) = 9x^2$, find $(g \circ f)(x)$.

- A. $\frac{9x^2}{4}$
- B. $\frac{9x^2}{2}$
- C. $\frac{36}{x^2}$
- D. $\frac{2}{9x^2}$

33. Complete numerical representations for the functions f and g are given. Evaluate the expression, if possible.

$(f \circ g)(5)$

x	1	4	10	12
$f(x)$	-4	10	2	12
x	-5	-4	1	5
$g(x)$	1	-5	4	10

- A. 4
- B. 10
- C. Undefined
- D. 2

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

$$F(x) = \frac{1}{x^2} + 9$$

- A. $f(x) = \frac{1}{x^2}$; $g(x) = 9$
- B. $f(x) = x$; $g(x) = \frac{1}{x} + 9$
- C. $f(x) = \frac{1}{x}$; $g(x) = \frac{1}{x} + 9$
- D. $f(x) = x + 9$; $g(x) = \frac{1}{x^2}$

1. D. All real numbers

2. B. $\{x \mid x \neq 1, x \neq -4\}$

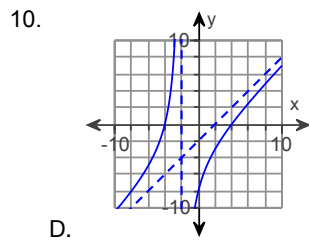
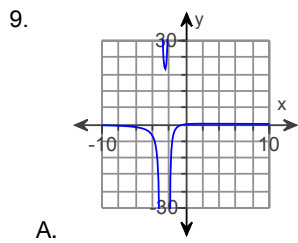
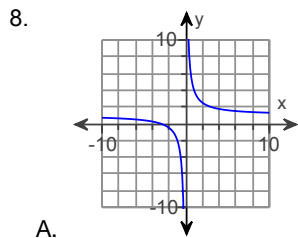
3. A. $x = 5, x = -5$

4. D. $y = \frac{4}{7}$

5. B. None

6. D. $x = 5, x = -6$

7. D. None



11. D. $-\frac{23}{2}$

12. C. -11.5

13. A. 4, 6

14. B. $(-10, -7) \cup (7, \infty)$

15. A. $\left(-7, -\frac{1}{2}\right) \cup (2, \infty)$

16. C. $(-\infty, -6) \cup \left(-\frac{11}{3}, \infty\right)$

17. D. $[-5, 0) \cup \left[0, \frac{1}{3}\right]$

18. D. 6

19. D. 81

20. D. $x^{3/7}$

21. A. $\frac{\sqrt[7]{b^4}}{\sqrt{a}}$

22. A. 3

23. D. No solution

24. C. -5

25. C. $7x + 6 + 3x^2$

26. C. $-2x + 4$

27. B. $12x^2 + 12x - 24$

28. A. $\sqrt{23}$

29. B. 10,847

30. B. 90

31. D. $\frac{10x}{7 - 35x}$

32. C. $\frac{36}{x^2}$

33. D. 2

34. D. $f(x) = x + 9; g(x) = \frac{1}{x^2}$
