ALBERTA MATH 30-1 · 25 QUESTIONS

Rational Functions — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The graph below shows a rational function. The non-permissible values of the function are**

- A: $x \neq 2$
- B: $x \neq -5$
- C: $x \neq 2$ and $x \neq -5$
- D: no restrictions

Understand It with Pulse | Flag a mistake

2 **The equation of the vertical asymptote of the graph of $y = \frac{3x + 1}{x - 4}$ is**

- A: $x = -4$
- B: $x = 4$
- C: $y = 4$
- D: $x = 3$

Understand It with Pulse | Flag a mistake

3 The graph of $y = \frac{5x - 2}{3x + 7}$ has a horizontal asymptote with equation $y = \frac{a}{b}$, where $\frac{a}{b}$ is in lowest terms. The value of $a + b$ is

ANSWER _____

Understand It with Pulse | Flag a mistake

4 The graph of $f(x) = \frac{x^2 - 9}{(x - 3)(x + 1)}$ has a vertical asymptote with equation

A $x = 3$

B $x = -3$

C $x = -1$

D $x = 1$

Understand It with Pulse | Flag a mistake

5 The solution to the equation $\frac{x}{x - 2} = 3$ is

- **A** 6
- **B** 3
- **C** -3
- **D** 2

Understand It with Pulse | Flag a mistake

6 The graph below shows a rational function. The vertical asymptotes of the graph are

- **A** x = 2
- **B** x = -2 and x = -3
- **C** x = 0
- **D** x = 2 and x = 3

Understand It with Pulse | Flag a mistake

7 **The graph below shows a rational function. The behaviour of the graph near its vertical asymptote is described in row**

- **A** As $x \to 3^-$, $y \to -\infty$ As $x \to 3^+$, $y \to +\infty$
- **B** As $x \to 3^-$, $y \to +\infty$ As $x \to 3^+$, $y \to -\infty$
- **C** As $x \to 3^-$, $y \to +\infty$ As $x \to 3^+$, $y \to +\infty$
- **D** As $x \to 3^-$, $y \to -\infty$ As $x \to 3^+$, $y \to -\infty$

Understand It with Pulse | Flag a mistake

8 **The point of discontinuity on the graph of $f(x) = \frac{x^2 - x - 6}{x - 3}$ is at**

- **A** (-3, 5)
- **B** (3, 2)
- **C** (3, 5)
- **D** (3, -5)

Understand It with Pulse | Flag a mistake

9 The equation of the oblique asymptote of the graph of $y = \frac{x^2 + 2x + 3}{x + 1}$ is

- **A** $y = x + 2$
- **B** $y = x + 1$
- **C** $y = x$
- **D** $y = x + 3$

Understand It with Pulse | Flag a mistake

10 The graph of $y = \frac{2x^2 + 3x - 2}{x^2 - x - 6}$ has exactly one vertical asymptote, with equation $x = k$. The value of k is

ANSWER _____

Understand It with Pulse | Flag a mistake

11 When the equation $\frac{1}{x - 2} + \frac{1}{x + 2} = \frac{4}{x^2 - 4}$ is solved algebraically, the result is

- **A** x = 2
- **B** x = -2
- **C** no solution
- **D** x = 0

Understand It with Pulse | Flag a mistake

12 The equation $x + \frac{6}{x} = 5$ has two solutions. The sum of the solutions is

ANSWER _____

Understand It with Pulse | Flag a mistake

13 The graph of $f(x) = \frac{x^2 + 2x - 8}{x + 4}$ has a point of discontinuity at (m, n). The value of m + n is

ANSWER _____

Understand It with Pulse | Flag a mistake

14 For the function $f(x) = \frac{2x^2 - 8}{(x - 2)(x + 5)}$, the vertical asymptote and the horizontal asymptote are shown in row

- **A** Vertical asymptote: x = -5 Horizontal asymptote: y = 2
- **B** Vertical asymptote: x = 2 Horizontal asymptote: y = 2
- **C** Vertical asymptote: x = -5 Horizontal asymptote: y = 1
- **D** Vertical asymptote: x = -5 Horizontal asymptote: y = -2

Understand It with Pulse | Flag a mistake

15 The graph below shows a rational function. The vertical asymptote and the horizontal asymptote are shown in row

- **A** Vertical asymptote: x = 3 Horizontal asymptote: y = 1
- **B** Vertical asymptote: x = -3 Horizontal asymptote: y = 1
- **C** Vertical asymptote: x = 3 Horizontal asymptote: y = -1
- **D** Vertical asymptote: x = -3 Horizontal asymptote: y = -1

Understand It with Pulse | Flag a mistake

16 **For the function $y = \frac{x - 1}{x^2 - x - 6}$, the vertical asymptotes and the x-intercept are shown in row**

A Vertical asymptotes: x = 3 and x = -2 x-intercept: 1

B Vertical asymptotes: x = 3 and x = -2 x-intercept: -1

C Vertical asymptotes: x = -3 and x = 2 x-intercept: 1

D Vertical asymptotes: x = 3 x-intercept: 1

Understand It with Pulse | Flag a mistake

17 **The horizontal asymptote of the graph of $y = \frac{kx^2 + 3x}{2x^2 - 5}$ is y = 4. The value of k is**

ANSWER _____

Understand It with Pulse | Flag a mistake

18 **The equation of the oblique asymptote of the graph of $y = \frac{2x^2 - 3x + 5}{x - 2}$ is**

- **A** $y = 2x + 7$
- **B** $y = 2x + 1$
- **C** $y = 2x - 1$
- **D** $y = x + 1$

Understand It with Pulse | Flag a mistake

19 **Which of the following statements about the graph of $y = \frac{x + 1}{x^2 - 1}$ is true?**

- **A** The vertical asymptote is $x = -1$
- **B** The horizontal asymptote is $y = 1$
- **C** The x-intercept is -1
- **D** There is a point of discontinuity at $(-1, \frac{-1}{2})$

Understand It with Pulse | Flag a mistake

20 The vertical asymptotes of the graph of $y = \frac{x + 4}{2x^2 + 5x - 3}$ are $x = a$ and $x = b$. The value of $a + b$ is

ANSWER _____

Understand It with Pulse | Flag a mistake

21 The average cost, in dollars, for a company producing x units is modelled by $C(x) = \frac{12x + 400}{x}$. As the number of units produced increases, the average cost approaches

A 400 dollars

B 0 dollars

C 12 dollars

D 412 dollars

Understand It with Pulse | Flag a mistake

22 The graph below shows a rational function. An equation of the function is

A $y = \frac{2x - 2}{x + 3}$

B $y = \frac{2x + 2}{x + 3}$

C $y = \frac{x - 1}{2x + 6}$

D $y = \frac{2x - 2}{x - 3}$

Understand It with Pulse | Flag a mistake

23 The graph of $y = \frac{x^2 + x - 12}{x^2 - 9}$ has a point of discontinuity at (3, n). The value of n, to the nearest hundredth, is

ANSWER _____

Understand It with Pulse | Flag a mistake

24 **For the function $y = \frac{3x - 7}{x - 2}$, the vertical asymptote and the horizontal asymptote are shown in row**

A Vertical asymptote: x = 2 Horizontal asymptote: y = 3

B Vertical asymptote: x = -2 Horizontal asymptote: y = 3

C Vertical asymptote: x = 2 Horizontal asymptote: $y = \frac{-7}{2}$

D Vertical asymptote: x = 3 Horizontal asymptote: y = 2

Understand It with Pulse | Flag a mistake

25 **As x approaches 3 from the left, the graph of $y = \frac{1}{(x - 3)(x + 2)}$ approaches**

A $-\infty$

B $+\infty$

C 0

D $\frac{1}{5}$

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. C
2. B
3. 8
4. C
5. B
6. D
7. A
8. C
9. B
10. 3
11. C
12. 5
13. -10
14. A
15. A
16. A
17. 8
18. B
19. D
20. -2.5
21. C
22. A
23. 1.17
24. A
25. A

© 2026 Brett Robbins. All Rights Reserved.