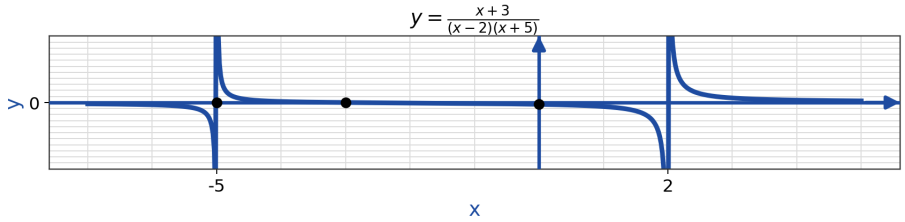
NUNAVUT MATH 30-1 · 25 QUESTIONS

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 ≠ 2
- **B** x ≠ -5
- **C** x ≠ 2 and x ≠ -5
- **D** no restrictions

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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** $x = 3$

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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 _____

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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

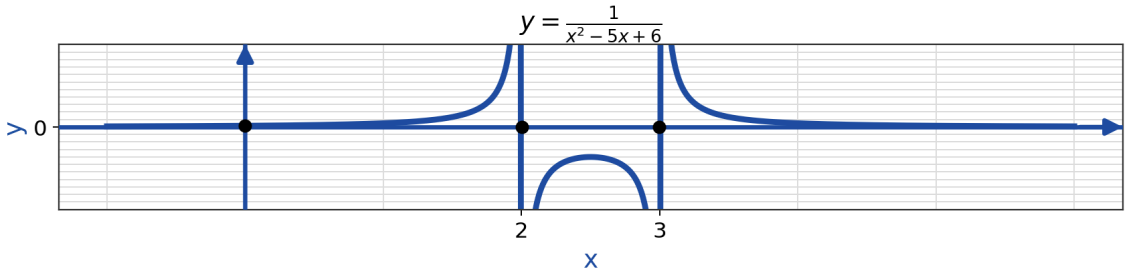
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5 The solution to the equation $\frac{x}{x - 2} = 3$ is

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

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



A x = 2

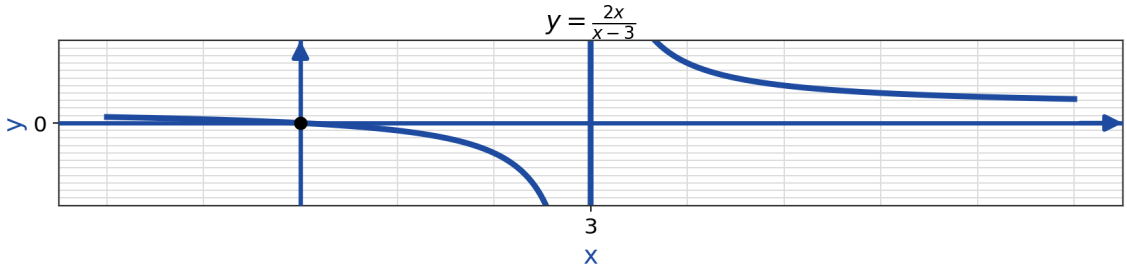
B x = -2 and x = -3

C x = 0

D x = 2 and x = 3

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



A As x → 3^-, y → -∞ As x → 3^+, y → +∞

B As x → 3^-, y → +∞ As x → 3^+, y → -∞

C As x → 3^-, y → +∞ As x → 3^+, y → +∞

D As x → 3^-, y → -∞ As x → 3^+, y → -∞

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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)

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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 $y = x + 3$

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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 _____

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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 $x = 0$

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

ANSWER _____

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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

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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

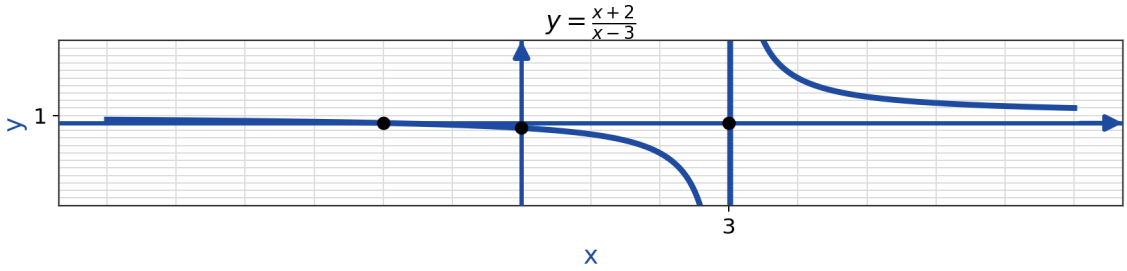
B Vertical asymptote: x = 2 Horizontal asymptote: y = 2

C Vertical asymptote: x = -5 Horizontal asymptote: y = 1

D Vertical asymptote: x = -5 Horizontal asymptote: y = -2

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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

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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

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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 _____

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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** $y = x + 1$

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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 $(-1, -\frac{1}{})$

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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 _____

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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

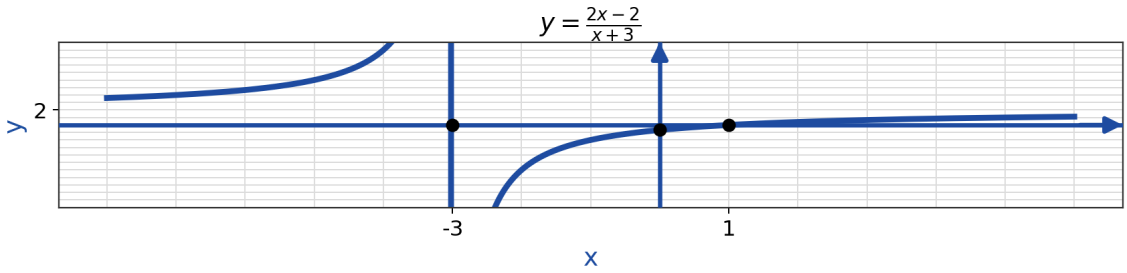
B 0 dollars

C 12 dollars

D 412 dollars

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



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

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

C $y = \frac{x - 1}{}$

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

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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 _____

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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 = $-\frac{7}{}$
- **D** Vertical asymptote: x = 3 Horizontal asymptote: y = 2

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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** $\frac{1}{}$

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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

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