NORTHWEST TERRITORIES CALCULUS 12 (MCALC12) · UNIT A · 25 QUESTIONS

Functions, Graphs and Limits — 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 domain of $f(x) = \sqrt{x - 3}$ is**

- **A** $x \geq 3$
- **B** $x > 3$
- **C** $x \leq 3$
- **D** $x \geq -3$

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2 **The range of $f(x) = x^2 + 4$ is**

- A $y \leq 4$
- B all real numbers
- C $y \geq 4$
- D $y > 4$

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3 **If $f(x) = 2x - 1$ and $g(x) = x + 3$, then $f(g(2))$ is**

- A 7
- B 9
- C 11
- D 5

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4 **The inverse of f(x) = 4x + 3 is**

- **A** $f^{-1}(x) = \frac{x + 3}{4}$
- **B** $f^{-1}(x) = \frac{x}{4} + 3$
- **C** $f^{-1}(x) = 4x - 3$
- **D** $f^{-1}(x) = \frac{x - 3}{4}$

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5 **The function $f(x) = x^3 - 2x$ is**

- **A** even
- **B** odd
- **C** neither even nor odd
- **D** both even and odd

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6 $\lim_{x \to 1} (2x^2 - 3x + 5)$ is

ANSWER

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7 $\lim_{x \to 4} x^2 - 16/x - 4$ is

ANSWER

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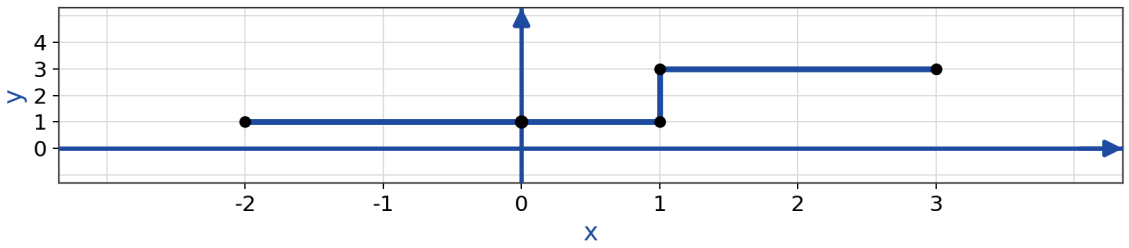
8 The graph shows a function with a jump at x = 1. The left-hand limit at x = 1 is



A 1

B 3

C 2

D does not exist

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9 $\lim_{x \to \infty} \frac{5x^2 - 2}{2x^2 + 7}$ is

- **A** $\frac{5}{7}$
- **B** $\frac{5}{2}$
- **C** 5
- **D** 0

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10 $\lim_{x \to \infty} \frac{4x - 1}{x^2 + 3}$ is

- **A** 4
- **B** 1
- **C** ∞
- **D** 0

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11 $\lim_{x \to \infty} \frac{x^3 + 2}{2x^2 - 1}$ is

A ∞

B 0

C $\frac{1}{2}$

D 2

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12 The function $f(x) = \frac{x^2 - 9}{x - 3}$ for $x \neq 3$ and $f(3) = a$ is continuous at $x = 3$ when a equals

A 3

B 0

C 9

D 6

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13 The discontinuity of $f(x) = \frac{x^2 - 4}{x - 2}$ at $x = 2$ is

A removable

B jump

C infinite

D none

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14 The vertical asymptote of $f(x) = \frac{x + 1}{x - 2}$ is

A $x = -1$

B $x = 1$

C $x = -2$

D $x = 2$

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15 The horizontal asymptote of $f(x) = \frac{3x + 2}{x - 5}$ is

- **A** $y = 5$
- **B** $y = 3$
- **C** $y = -5$
- **D** $y = \frac{2}{5}$

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16 For $f(x) = x^2 - 4$, the value of $f(2)$ is

- **A** 0
- **B** 4
- **C** -4
- **D** 2

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17 $\lim_{x \to 3^-} \frac{|x-3|}{x-3}$ is

A 1

B 0

C -1

D does not exist

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18 $\lim_{x \to 0} \frac{\sin 2x}{x}$ is

A 1

B 0

C 2

D $\frac{1}{2}$

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19 $\lim_{x \to 9} \frac{\sqrt{x} - 3}{x - 9}$ is

- **A** $\frac{1}{3}$
- **B** $\frac{1}{9}$
- **C** 3
- **D** $\frac{1}{6}$

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20 **A function f is continuous at x = a if**

- **A** $\lim_{x \to a} f(x) = f(a)$
- **B** $\lim_{x \to a}$ f(x) exists, but need not equal f(a)
- **C** f(a) is defined, but the limit need not exist
- **D** the left and right limits differ

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21 As $x \to \infty$, the value of $-x^4 + 3x$ approaches

- A ∞
- B 0
- C $-\infty$
- D 3

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22 For $f(x) = 1/(x - 1) + 2$, its horizontal asymptote is

- A $y = 1$
- B $y = -1$
- C $y = 2$
- D $y = 0$

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23 The domain of $f(x) = \frac{x}{x^2 - 4}$ excludes

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

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24 $\lim_{x \to \infty} \frac{\sqrt{4x^2 + 1}}{x}$ is

- **A** 4
- **B** 1
- **C** 2
- **D** 0

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25 **The piecewise function f(x) = x + 1 for x < 2 and f(x) = kx for x ≥ 2 is continuous at x = 2 when k equals**

A 2

B 1

C $\frac{3}{2}$

D 3

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ANSWER KEY

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

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