FINAL EXAM - PRACTICE TEST | NEW BRUNSWICK CALCULUS 120 · FINAL EXAM · 50 QUESTIONS

Final Exam — 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 **For $f(x) = x^4$, the derivative $f'(x)$ at $x = 2$ is**

ANSWER _____

Understand It with Pulse | Flag a mistake

2 **For $f(x) = 4x^2 + 2$, the average rate of change from $x = 0$ to $x = 2$ is**

ANSWER _____

Understand It with Pulse | Flag a mistake

3 **For $f(x) = -x^2 + 8x + 3$, the maximum value is**

ANSWER _____

Understand It with Pulse | Flag a mistake

4 **For $f(x) = x^3 + 3x^2$, the inflection point is at $x =$**

ANSWER _____

Understand It with Pulse | Flag a mistake

5 **LHopital rule can be used for a limit of the form infinity minus infinity**

- A no
- B only for polynomials
- C yes, after rewriting
- D never

Understand It with Pulse | Flag a mistake

6 **For $f(x) = 3x^2 + 2x$, the derivative at $x = 1$ is**

ANSWER _____

Understand It with Pulse | Flag a mistake

7 **For $f(x) = 2x^2 + 3$, the instantaneous rate of change at $x = 1$ is**

ANSWER _____

Understand It with Pulse | Flag a mistake

8 **A rectangle with perimeter 40 m has maximum area when it is a square. The maximum area in m² is**

ANSWER

Understand It with Pulse | Flag a mistake

9 **For f(x) = x³ , the graph is concave up when x is**

Question 9

For $f(x) = x^3$ *, the* graph *is* concave *up* when *x is*

A) less than 0

B) greater than 0

C) equal to 0

D) always concave down

A less than 0

B greater than 0

C equal to 0

D always concave down

Understand It with Pulse | Flag a mistake

10 **The limit as x approaches 0 of (e²ˣ - 1) / x is**

ANSWER

Understand It with Pulse | Flag a mistake

11 **For $f(x) = x^2 - 3x + 2$, the value of $f'(2)$ is**

ANSWER _____

Understand It with Pulse | Flag a mistake

12 **A particle has position $s(t) = t^2$. Its instantaneous velocity at $t = 4$, in metres per second, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

13 **A rectangle has perimeter 36 metres and is a square at its largest area. The side length, in metres, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

14 **For $f(x) = (x - 2)^3$, the inflection point is at $x =$**

ANSWER _____

Understand It with Pulse | Flag a mistake

15 **Applying Lhopital rule to (e^(3x) - 1)/x as x approaches 0 gives**

ANSWER _____

Understand It with Pulse | Flag a mistake

16 **For f(x) = 4 sin x , the derivative at x = 0 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

17 **For f(x) = x² - 4x , the critical point is at x =**

ANSWER _____

Understand It with Pulse | Flag a mistake

18 **A farmer has 80 m of fencing for a rectangular field against a wall, using the wall for one side. The maximum area in m² is**

ANSWER _____

Understand It with Pulse | Flag a mistake

19 **For f(x) = 4x² + 2 , the second derivative is**

ANSWER _____

Understand It with Pulse | Flag a mistake

20 **The limit as x approaches 5 of (x² - 25) / (x - 5) is**

ANSWER _____

Understand It with Pulse | Flag a mistake

21 **For f(x) = 2 cos x , the derivative at x = 0 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

22 **For f(x) = x² - 4x , the derivative at x = 3 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

23 **A box with a square base of side 30 cm and height 5 cm has volume in cm^3 of**

ANSWER _____

Understand It with Pulse | Flag a mistake

24 **For $f(x) = x^3 + 12x^2$, the inflection point is at x =**

ANSWER _____

Understand It with Pulse | Flag a mistake

25 **The limit as x approaches infinity of (2x + 1) / (2x + 1) is**

ANSWER _____

Understand It with Pulse | Flag a mistake

26 **For f(x) = cos x - sin x , the value of f'(0) is**

ANSWER _____

Understand It with Pulse | Flag a mistake

27 **If f'(x) = 4x , then f'(3) is**

ANSWER _____

Understand It with Pulse | Flag a mistake

28 **For $f(x) = x^3 - 2x^2$, the value of f at x = 3 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

29 **For $f(x) = x^4$, the second derivative at x = 1 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

30 **The limit of $\ln \frac{x}{x}$ as x grows without bound is**

ANSWER _____

Understand It with Pulse | Flag a mistake

31 **For f(x) = 4xx¹ , the derivative at x = 1 is**

ANSWER

Understand It with Pulse | Flag a mistake

32 **For points (1,2) and (4,14) on a graph, the average rate of change is**

Question 32

For points (1, 2) and (4, 14) on a graph, the average rate of change is

ANSWER

Understand It with Pulse | Flag a mistake

33 **For f(x) = x³ - 6x² , the value of f at x = 3 is**

ANSWER

Understand It with Pulse | Flag a mistake

34 **For f(x) = x³ - 6x , the second derivative at x = 1 is**

ANSWER

Understand It with Pulse | Flag a mistake

35 **The limit as x approaches 0 of sin(3x) / x is**

ANSWER _____

Understand It with Pulse | Flag a mistake

36 **For f(x) = (x + 1)² , the derivative at x = 0 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

37 **For f(x) = x³ - 3x , the derivative at x = 2 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

38 **For f(x) = -x² + 8x , the derivative at the maximum point is**

ANSWER _____

Understand It with Pulse | Flag a mistake

39 **For f(x) = x^4 , the second derivative at x = 4 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

40 **The limit as x approaches 0 of (1 - cos(2x) / x^2 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

41 **For f(x) = (x + 1)^6 , the derivative at x = 0 is**

ANSWER _____

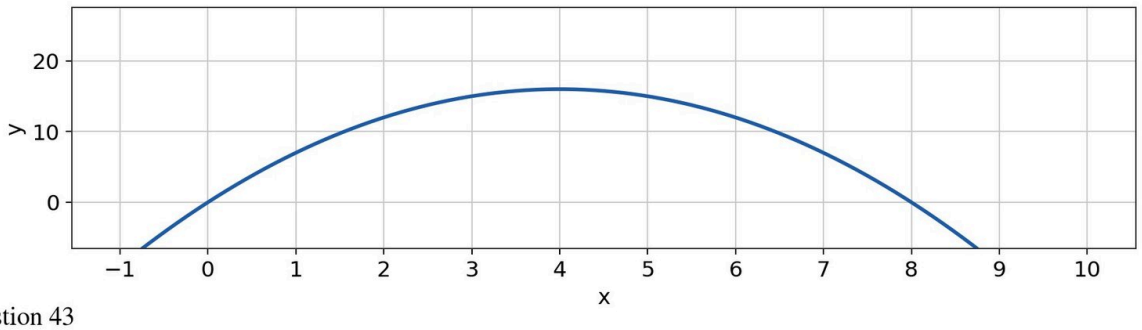
Understand It with Pulse | Flag a mistake

42 **For f(x) = x^3 - 3x , the derivative at x = 6 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

43 The graph shows a quadratic function. Its maximum occurs at x =



Question 43

The graph shows a quadratic function. Its maximum occurs at x =

ANSWER

Understand It with Pulse | Flag a mistake

44 For f(x) = x⁴ , the second derivative at x = 5 is

ANSWER

Understand It with Pulse | Flag a mistake

45 The limit as x approaches 0 of (1 - cos(6x) / x² is

ANSWER

Understand It with Pulse | Flag a mistake

46 **For f(x) = sin(4x) , the derivative at x = 0 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

47 **For f(x) = $4x^2$ + 2 , the average rate of change from x = 1 to x = 3 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

48 **The function f(x) = $-x^2$ + 24x has its maximum at x =**

ANSWER _____

Understand It with Pulse | Flag a mistake

49 **For f(x) = x^3 - 3x , the second derivative at x = 1 is**

ANSWER _____

Understand It with Pulse | Flag a mistake

50 **Direct substitution in the limit as x approaches 4 of (x^2 - 16) / (x - 4) gives the form**

A $\frac{1}{0}$

B a finite number

C $\frac{0}{0}$

D infinity

Understand It with Pulse | Flag a mistake

ANSWER KEY

1.	32	**18.**	800	**35.**	3
2.	8	**19.**	8	**36.**	2
3.	19	**20.**	10	**37.**	9
4.	-1	**21.**	0	**38.**	0
5.	C	**22.**	2	**39.**	192
6.	8	**23.**	4500	**40.**	2
7.	4	**24.**	-4	**41.**	6
8.	100	**25.**	1	**42.**	105
9.	B	**26.**	-1	**43.**	4
10.	2	**27.**	12	**44.**	300
11.	1	**28.**	9	**45.**	18
12.	8	**29.**	12	**46.**	4
13.	9	**30.**	0	**47.**	16
14.	2	**31.**	8	**48.**	12
15.	3	**32.**	4	**49.**	6
16.	4	**33.**	-27	**50.**	C
17.	2	**34.**	6		

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