NORTHWEST TERRITORIES CALCULUS 12 (MCALC12) · UNIT C · 10 QUESTIONS

Applications of Differentiation — 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 function $f(x) = -x^3 + 2x^2$ is concave down on**

- **A** $x < 0$
- **B** $x > 0$
- **C** $x < 2$
- **D** $x > \frac{2}{}$

Understand It with Pulse | Flag a mistake

2 A cube has side s growing at 0.2 cm/s . When s = 5 cm, $\frac{dV}{dt}$ is

- **A** 15 cm^3/s
- **B** 25 cm^3/s
- **C** 5 cm^3/s
- **D** 75 cm^3/s

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3 A rectangle has length 6 cm growing at 1 cm/s and width 3 cm growing at 2 cm/s. The rate of change of its area is

- **A** 9 cm^2/s
- **B** 12 cm^2/s
- **C** 15 cm^2/s
- **D** 18 cm^2/s

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4 A circle expands with $\frac{dr}{dt} = 1$ cm/s. When $r = 10$ cm, $\frac{dA}{dt}$ is

- **A** 10π cm²/s
- **B** 20π cm²/s
- **C** 100π cm²/s
- **D** 40π cm²/s

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5 With 80 m of fencing for a rectangle, the greatest possible area is

- **A** 1600 m²
- **B** 800 m²
- **C** 400 m²
- **D** 3200 m²

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6 **Two positive numbers sum to 18. Their greatest possible product is**

ANSWER _____

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7 **The profit function is $P(x) = -x^2 + 30x - 40$. It is maximized when x equals**

A 30

B 15

C 10

D 20

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8 The derivative is f'(x) = -2x + 6. The function f is decreasing on

- **A** x < 3
- **B** x > 3
- **C** x < -3
- **D** x > 6

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9 For f(x) = -x² + 4x, with vertex at (2, 4), the local maximum value is

- **A** 2
- **B** 0
- **C** 4
- **D** 8

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10 **A square has side s shrinking at 2 cm/s . When s = 6 cm, the area changes at**

A 24 cm^2/s

B -12 cm^2/s

C -24 cm^2/s

D 12 cm^2/s

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ANSWER KEY

1. D
2. A
3. C
4. B
5. C
6. 81
7. B
8. B
9. C
10. C

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