

Derivative of the Natural Exponential Function

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the derivative.

1) $f(x) = 3e^{8x}$ 1) _____
A) $3e^{24x}$ B) $3xe^{24x}$ C) $24xe^{8x}$ D) $24e^{8x}$

2) $g(x) = 3x^2e^{-x}$ 2) _____
A) $3xe^x(2-x)$ B) $3xe^{-x}(2-x)$ C) $3xe^{-x}(x+2)$ D) $6xe^{-x}(1-x)$

3) $f(x) = \frac{9e^x}{2e^x + 1}$ 3) _____
A) $\frac{9e^x}{(2e^x + 1)^3}$ B) $\frac{9e^x}{(2e^x + 1)^2}$ C) $\frac{e^x}{(2e^x + 1)^2}$ D) $\frac{9e^x}{(2e^x + 1)}$

4) $f(x) = \cos e^{5x}$ 4) _____
A) $-5e^{5x} \sin e^{5x}$ B) $e^{5x} \cos e^{5x}$ C) $-5 \sin e^{5x}$ D) $5e^{5x} \sin e^{5x}$

5) $f(x) = \sin 4e^{2x}$ 5) _____
A) $e^{2x} \cos 4e^{2x}$ B) $\cos 4e^{2x}$
C) $-8e^{2x} \cos 4e^{2x}$ D) $8e^{2x} \cos 4e^{2x}$

Find the derivative of y with respect to x, t, or θ , as appropriate.

6) $y = 10e^\theta(\sin \theta - \cos \theta)$ 6) _____
A) $20e^\theta(\sin \theta - \cos \theta)$ B) $20e^\theta \sin \theta$
C) 0 D) $10e^\theta(\sin \theta - \cos \theta) + 10e^\theta$

7) $y = \sin e^{-\theta^3}$ 7) _____
A) $\cos(-3\theta^2 e^{-\theta^3})$ B) $\cos e^{-\theta^3}$
C) $3\theta^2 \cos e^{-\theta^3}$ D) $(-3\theta^2 e^{-\theta^3}) \cos e^{-\theta^3}$

Find an equation of the line tangent to the given curve at the point (a, f(a)).

8) $f(x) = e^{8x}$, $a = 0$ 8) _____
A) $y = x + 1$ B) $y = 8e + 1$ C) $y = 8x + 8$ D) $y = 8x + 1$

9) $f(x) = 3e^{-8x}$, $a = 0$ 9) _____
A) $y = 24x - 3$ B) $y = -24x + 3$ C) $y = 3x + 3$ D) $y = 8x - 3$

10) $f(x) = 2e^{7x}$, $a = 0$ 10) _____
A) $y = 7x + 2$ B) $y = 14x + 2$ C) $y = 2x + 2$ D) $y = -14x + 2$

Answer Key

Testname: DERIVATIVE OF THE NATURAL EXPONENTIAL FUNCTION

- 1) D
- 2) B
- 3) B
- 4) A
- 5) D
- 6) B
- 7) D
- 8) D
- 9) B
- 10) B