MAC 2233
HW Quiz on Derivatives
Fall 2019

Name: _____
Date: _____

This Quiz is worth 30 points. Each problem is worth 2 points. You MUST show you work to receive any credit. Tutors may assist you with this quiz, but they may not do the work for you.

Find the derivative.

1) $f(x) = \frac{6}{\sqrt{x}} - \frac{2}{x} + \frac{6}{x^3}$ 1) _____

A) $f'(x) = -\frac{3}{x^{3/2}} - \frac{2}{x^2} - \frac{18}{x^2}$

B) $f'(x) = \frac{3}{x^{1/2}} - \frac{2}{x^2} - \frac{18}{x^4}$

C) $f'(x) = -\frac{3}{x^{3/2}} + \frac{2}{x^2} - \frac{18}{x^4}$

D) $f'(x) = -3\sqrt{x} + \frac{2}{x^2} - \frac{18}{x^2}$

Find f ′(a) for the given value of a.

2) $f(x) = -x^{-5} + x^{-3}$, $a = 1$ 2) _____

Find the equation of the line tangent to the graph of the function at the indicated point.

3) $f(x) = \frac{45}{x}$ at (3, 15) 3) _____

Find all values of x (if any) where the tangent line to the graph of the function is horizontal.

4) $y = x^3 + 7x^2 - 245x + 35$ 4) _____

Differentiate.

5) $g(x) = (x^{-5} + 3)(x^{-3} + 5)$ 5) _____

A) $g'(x) = -8x^{-9} - 25x^{-6} - 9x^{-2}$

B) $g'(x) = -8x^{-9} - 25x^{-6} - 9x^{-4}$

C) $g'(x) = -8x^{-7} - 25x^{-6} - 9x^{-4}$

D) $g'(x) = -8x^{-9} - 25x^{-4} - 9x^{-4}$

6) $f(x) = \sqrt[5]{x^7 + 9x}$ 6) _____

A) $f'(x) = \frac{1}{5}(x^7 + 9x)^{-4/5}(7x^6 + 9)$

B) $f'(x) = \frac{1}{5}(x^7 + 9x)^{-4/5}$

C) $f'(x) = \frac{1}{5}(7x^6 + 9)^{-4/5}$

D) $f'(x) = \frac{1}{5}(x^7 + 9x)^{1/4}(7x^6 + 9)$

7) $y = (2x - 1)^3(x + 7)^{-3}$ 7) _____

A) $\frac{dy}{dx} = 45(2x - 1)^3(x + 7)^{-2}$

B) $\frac{dy}{dx} = 45(2x - 1)^2(x + 7)^{-3}$

C) $\frac{dy}{dx} = 45(2x - 1)^2(x + 7)^{-4}$

D) $\frac{dy}{dx} = 45(2x - 1)^3(x + 7)^{-4}$

Find $\frac{d^2y}{dx^2}$.

8) $y = \frac{x}{x + 1}$ 8) _____

Find the derivative.

9) $y = \frac{2e^x}{2e^x + 1}$ 9) _____

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

10) $y = \left(e^{x^3} - 1\right)^5$ 10) _____

11) $y = e^{x^3} \ln x$ 11) _____

A) $\frac{3x^3 e^{x^3} + 1}{x}$ B) $\frac{e^{x^3} + 3x^3 e^{x^3} \ln x}{x}$

C) $\frac{e^{x^3} + 3e^{x^3} \ln x}{x}$ D) $\frac{e^{x^3} + 3x^2 e^{x^3} \ln x}{x}$

12) $f(x) = \ln (e^{4x} - 6)$ 12) _____

13) $f(x) = (\ln x)^8$ 13) _____

14) $f(x) = \frac{x + 9}{\sqrt{x}}$, find $f'(x)$ 14) _____

A) $\frac{1}{2\sqrt{x}} - \frac{9}{2x}$ B) $x^{3/2} + 9\sqrt{x}$ C) $\frac{1}{2\sqrt{x}} - \frac{9}{2x^{3/2}}$ D) $\frac{1}{\sqrt{x}} + \frac{9}{x^{3/2}}$

Give an appropriate answer.

15) If $g'(-3) = 8$ and $h'(-3) = 6$, find $f'(-3)$ for $f(x) = -3g(x) - 2h(x) + 3$. 15) _____