

Quiz Derivatives A 2019

Introduction to Calculus 40 points

Name _____

Find the derivative of each function. Simplify each answer. (5 points each)

$$1) y = 2x^5 + \frac{3x^{2/3}}{4} + 2\cos(x) - (6)^x + 8$$

$$y' = 10x^4 + \frac{1}{2}x^{-1/3} - 2\sin(x) - (\ln 6)6^x$$

$$2) g(x) = x^3 \cdot \sin(x)$$

$$g'(x) = 3x^2 \sin(x) + x^3 \cos(x)$$

$$3) f(x) = 2(10)^{3x^2}$$

$$f'(x) = 2(\ln 10)10^{3x^2} (6x)$$

$$f'(x) = (12x)(\ln 10)(10^{3x^2})$$

$$4) f(x) = \frac{6x+1}{5x-2} \quad f'(x) = \frac{6(5x-2) - (6x+1)(5)}{(5x-2)^2}$$

$$f'(x) = \frac{30x-12-30x-5}{(5x-2)^2}$$

$$f'(x) = \frac{-17}{(5x-2)^2}$$

$$5) y = \sin^5(x^4 - 2x) = (\sin(x^4 - 2x))^5$$

$$y' = 5(\sin(x^4 - 2x))^4 \cdot \cos(x^4 - 2x) (4x^3 - 2)$$

$$6) h(x) = \frac{8x}{e^{2x+1}} \quad h'(x) = \frac{\cancel{8}(e^{2x+1}) - 8x \cdot (\cancel{e^{2x+1}}) 2}{(e^{2x+1})^2}$$

$$h'(x) = \frac{8 - 16x}{(e^{2x+1})}$$

Find the derivative of each function. Do NOT simplify answers. (5 points each)

$$7) f(x) = e^{\sin x} \sqrt{(2x^3 - 4x)}$$

$$f'(x) = e^{\sin x} (\cos x) (2x^3 - 4x)^{1/2} + e^{\sin x} \cdot \frac{1}{2} (2x^3 - 4x)^{-1/2} (6x^2 - 4)$$

$$8) f(x) = \left(\frac{2x-3}{3x^2+5x-1} \right)^9$$

$$f'(x) = 9 \left(\frac{2x-3}{3x^2+5x-1} \right)^8 \left(\frac{2(3x^2+5x-1) - (2x-3)(6x+5)}{(3x^2+5x-1)^2} \right)$$