$\boxed{7}$ $\frac{40}{40}$

Quiz Derivatives A 2018 **Name** Answers
Introduction to Calculus

Find the derivative of each function. Simplify each answer.

4 pts each

-1 if no y'

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

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

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

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

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

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

$= 12\ln 10 \cdot x \cdot 10^{3x^2}$

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

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

$= \frac{30x - 12 - 30x - 5}{(5x-2)^2}$ (+1 to simplify)

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

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

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

(+4)

6) $h(x) = \dfrac{8x}{e^{2x+1}}$

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

Find the derivative of each function. <u>Do NOT simplify answers</u>.

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

No product (−2)

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

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

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

$\boxed{\text{or}}$

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