Math 135, Calculus 1, Fall 2020

Weekly Quiz 10-20

Show all work: clearly indicate your answer and the reasoning used to arrive at the answer. Unsupported answers may not receive full credit.

Question 1. Find $f(4)$ and $f'(4)$, assuming that the tangent line to $y = f(x)$ at $a = 4$ has equation $y = 10x + 7$.

$y = f'(a)(x-a) + f(a)$

$f'(4)(x-4) + f(4) = 10x + 7$

$f'(4)x - 4f'(4) + f(4) = 10x + 7$

$\boxed{f'(4) = 10}$

$-4f'(4) + f(4) = 7$

$-4(10) + f(4) = 7$

$\boxed{f(4) = 47}$

Question 2. Use the Product Rule to calculate $\frac{d}{dx}\left((5x^3 + 2x^2) \cdot \left(1 + \frac{3}{x}\right)\right)$. Do not simplify.

$= \frac{d}{dx}(5x^3 + 2x^2)\left(1 + \frac{3}{x}\right) + (5x^3 + 2x^2)\frac{d}{dx}\left(1 + \frac{3}{x}\right)$

$= \boxed{(15x^2 + 4x)\left(1 + \frac{3}{x}\right) + (5x^3 + 2x^2)\left(-\frac{3}{x^2}\right)}$