MATH 1550 Test 2 2020-02-28

NAME:

Exercise 1 If $f(3) = 4, f'(3) = -2, f'(4) = 5, g(3) = 3, g'(3) = -4$, and $F = f \circ g$, then find $F'(3)$.

Exercise 2 Find the equation of the tangent line to the graph of $y = (x^3 + 2x)^4$.

Exercise 3 The cost in dollars, of producing x units of a certain commodity is

$$C(x) = 9200 + 20x - 2x^2 + 0.001x^3.$$

Find the marginal cost function and $C'(100)$.

Exercise 4 Find the linear approximation to $f(x) = \sqrt[3]{1 + 3x}$ at $x = 0$, and use it to approximate $\sqrt[3]{1.03}$.

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Exercise 5 If $y = x^3 - 2x^2 + 1$, find $\mathrm{d}y$. Evaluate $\mathrm{d}y$ if $x = 2$ and $\mathrm{d}x = 0.2$.

Exercise 6 Find the derivative of each function. **Do Not Simplify.**

i. $xy^2 + 2y^3 = 3 + 2x^2$

iii. $y = (2x + 3)^{\sin(x)}$

ii. $y = \ln\left(\frac{(3x^2+e^x)^2 \sin(x)}{2x^2+4}\right)$