

Quiz

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (5 points) Consider the function

$$f(x) = 2x^{12} + 10x^2 + \sqrt{x+1} + 57.$$

Use the power rule to find the derivative $f'(x)$.

Solution: Notice that we can rewrite our function $f(x)$ as $f(x) = 2x^{12} + 10x^2 + (x+1)^{1/2} + 57$, and now use the product rule to take the derivative of it. That is,

$$\begin{aligned} f'(x) &= \left(2x^{12} + 10x^2 + (x+1)^{1/2} + 57 \right)' \\ &= (2x^{12})' + (10x^2)' + \left((x+1)^{1/2} \right)' + (57)' \\ &= 2(x^{12})' + 10(x^2)' + \left((x+1)^{1/2} \right)' + (57)' \\ &= 2 \cdot 12x^{11} + 2 \cdot 10x + \frac{1}{2}(x+1)^{1/2-1} + 0 \\ &= 24x^{11} + 20x + \frac{1}{2\sqrt{x+1}}. \end{aligned}$$

2. (5 points) Find the derivative, $g'(x)$, if $g(x) = \sqrt[7]{x^2 + 6x + 7}$.

Solution: Notice that we can rewrite our function $g(x)$ as $g(x) = (x^2 + 6x + 7)^{1/7}$, and now use power rule and chain rule to take a derivative of it. That is,

$$\begin{aligned} g'(x) &= \left((x^2 + 6x + 7)^{1/7} \right)' \\ &= \frac{1}{7}(x^2 + 6x + 7)^{1/7-1} \cdot (x^2 + 6x + 7)' \\ &= \frac{1}{7}(x^2 + 6x + 7)^{-6/7} \cdot (2x + 6) \\ &= \frac{2x + 6}{7 \cdot \sqrt[7]{(x^2 + 6x + 7)^6}}. \end{aligned}$$

Name: _____

Section (circle one): 021 022 023 024

Question:	1	2	Total
Points:	5	5	10
Score:			