MAT 201 Quiz 10

Apr. 2, 2020

1. [15] Find the derivative of the function

$$g(x) = \sin(\ln(x)).$$

2. [17] Find the derivative of the function

$$h(z) = \arctan(z^2).$$

3. [18] Find the derivative of the function

$$p(w) = 2^w \ln(w).$$

4. [19] Find the derivaitve of the function

$$f(y) = \frac{e^y}{\arcsin(y)}.$$

5. [20] Find the derivative of the function

$$q(v) = \ln(\cos(v^2))$$

6. [21] Let $f(x)$ be a differentiable function with a differentiable inverse function $f^{-1}(x)$. Suppose we know that $f(3) = 4$, $f'(3) = 5$, $f(4) = 6$, $f'(6) = 2$. Find the derivative of $f^{-1}(x)$ at $x = 4$.

7. [1] If $g(t) = t^2 - 1$ represents the motion of an object at time t (in seconds), find the most simplified version for the average velocity of the ball on the interval $[2, 2+h]$. Use your result to estimate the instantaneous velocity at the time $t = 2$. You must show all work.

8. [2] Evaluate the following limit algebraically.

$$\lim_{x \to -3} \frac{x^2 + x - 6}{x^2 + 4x + 3}$$