

MAT 201 Quiz 12

Apr. 14, 2020

1. 21 Let $f(x)$ be a differentiable function with a differentiable inverse function $f^{-1}(x)$. Suppose we know that $f(7) = 5$, $f'(5) = 8$, $f(2) = 7$, $f'(2) = 4$. Find the derivative of $f^{-1}(x)$ at $x = 7$. Show all work.
2. 22 Use implicit differentiation to find dy/dx if $e^{xy} + x^2 - y^2 = 10$. Show all work.

3. 12 Use linear approximation of the function $f(x) = \sqrt{x}$ at $x = 9$ to estimate $\sqrt{9.06}$. Show all work.
4. 25 A sailboat is sitting at rest near its dock. A rope attached to the bow of the boat is drawn in over a pulley that stands on a post on the end of the dock that is 5 feet higher than the bow. If the rope is being pulled in at a rate of 2 feet per second, how fast is the boat approaching the dock when the length of rope from bow to pulley is 13 feet? Show all work with necessary picture and computation.