

Quiz 10 Solution - Math 165

Name: _____

Show all work to receive maximum credit for each problem. You may not use your book, notes, or a calculator on this quiz. Give exact answers, not decimal approximations. This quiz is worth 25 points.

1. (5 points) Evaluate $D_x[e^{x^3}]$

Solution: $3x^2e^{x^3}$

2. (5 points) Evaluate $\int xe^{x^2} dx$

Solution: $\frac{1}{2}e^{x^2} + C$

3. (5 points) Evaluate $D_x[(6x + 1)e^{2x}]$

Solution: $6e^{2x} + 2(6x + 1)e^{2x}$

4. (5 points) Assume f is a one-to-one function such that $f(2) = 4$ and $f'(2) = -3$. Use the Inverse Function Theorem to find the value of $(f^{-1})'(4)$?

Solution: $-\frac{1}{3}$

5. (5 points) Let $f(x) = 3x - 1$. Find a formula for $f^{-1}(x)$. Then verify your answer by checking that $f^{-1}(f(x)) = x$ and $f(f^{-1}(y)) = y$.

Solution: $f^{-1}(x) = \frac{1}{3}x + \frac{1}{3}$