

Math 131 - Homework 4

October 27, 2021

Name _____

Score _____

The following problems are from the suggested homework. **Show all work to receive full credit.** Supply explanations when necessary. This assignment is due November 3.

1. (1 point) Let $f(x) = x^3 + 2x + 3$. Find $(f^{-1})'(0)$.

2. (1 point) Use the following information to find $(f^{-1})'(a)$.

$$f(1) = -3, \quad f'(1) = 10, \quad a = -3$$

3. (1 point) Find $\frac{dy}{dx}$ if $y = \cos^{-1}(\sqrt{x})$.

4. (1 point) Find $f'(x)$ if $f(x) = \log_7(6x^4 + 3)^5$.

Turn over.

5. (1 point) Find $f'(x)$ if $f(x) = e^{x^3 \ln x}$.

6. (2 points) Use logarithmic differentiation to find $\frac{dy}{dx}$ when $y = (\sin 2x)^{4x}$.

7. (2 points) A 10-ft ladder is leaning against a wall. If the top of the ladder slides down the wall at a rate of 2 ft/sec, how fast is the bottom moving along the ground when the bottom of the ladder is 5 ft from the wall?

8. (1 point) Find the linearization of $f(x) = \frac{1}{x}$ at $x = 2$.