Name: _____ Mark: _____

Mini-math Div 3/4: Monday, February 1, 2021 (15 minutes)

1. (2 points) Let f be a differentiable function such that:

$$f(4) = 6, \quad f(8) = 4, \quad f'(4) = -3, \quad f'(8) = -5.$$

Suppose the function $g(x) = f^{-1}(x)$ is differentiable for all x. What is $g'(4)$?

2. (4 points) Find the equation of the line tangent to the given curve at the given point.

$$e^x + \ln(x + y) = x + 1, \quad \text{at } (0, 1)$$

3. (2 points) Find $f(t)$ if $f(t) = 2^{3^x}$.

4. Find the derivative of y with respect to x in each of the following.

   (a) (2 points) $y = \ln|x^4 - 4|$

   (b) (2 points) $y = \log_2\left(\dfrac{\sin x}{2^x}\right)$

5. (4 points) Find the derivative of y with respect to x in the following via logarithmic differentiation. **You do not need to simplify your final expression, and may express your answer in terms of both y and x.**

$$y = \sqrt{\frac{(x+1)^2(2x-1)^3}{x}}$$