AP Calculus AB | Homework 1023 | Name:
Dr. Paul L. Bailey | Monday, January 23, 2023

Write solutions *clearly* in complete sentences. Due Tuesday, January 24, 2023.

Problem 1. Compute the following.

(a) $\dfrac{d}{dx}\exp_5(x^3)$

(b) $\dfrac{d}{dx}\log_7(x^2)$

Problem 2. Consider the function $f : [-2, \infty) \to [1, \infty)$ given by $f(x) = x^3 - 3x$. This function is bijective on its stated domain and codomain. Let $g : [1, \infty) \to [-2, \infty)$ be its inverse. Let $a = 2$ and $b = f(a)$. Find $g'(b)$.

Problem 3. Let $f(x) = e^{x^2-4x-21}$.

(a) Solve $f(x) = 1$.

(b) Find the critical points of f. Classify each as a local minimum, maximum, or neither.

Problem 4. Let R be the region in the first quadrant bounded by $x = 0$, $x = 1$, $y = 0$, and $y = e^{x^2}$. Find the volume obtained by revolving R about the y-axis.