MATH 30: LECTURE 54 WORKSHEET

Please write your work and answers on another piece of paper.

(1) Find the absolute maximum and absolute minimum of the function $f(x) = (x^2 - 1)^3$ on the interval $[-1, 2]$.

(2) Evaluate the integral by interpreting it in terms of area: $\displaystyle\int_0^{10} |x - 5|\, dx$.

(3) Define $f(x) = \displaystyle\int_{-1}^{x} t^2 \sin t\, dt$. Find the critical numbers of f on the interval $(-1, 4)$.

(4) Evaluate the integral $\displaystyle\int_{-2}^{2} f(x)\, dx$ where

$$f(x) = \begin{cases} 2 & \text{if } -2 \le x \le 0 \\ 4 - x^2 & \text{if } 0 < x \le 2. \end{cases}$$

(5) Evaluate the integral $\displaystyle\int_1^2 \frac{(x-1)^3}{x^2}\, dx$.

(6) If f is continuous and $\displaystyle\int_0^9 f(x)\, dx = 4$, find $\displaystyle\int_0^3 x\, f(x^2)\, dx$.

(7) Evaluate the indefinite integral $\displaystyle\int \frac{\cos\left(\frac{\pi}{x}\right)}{x^2}\, dx$. Check your answer.