Calculus Worksheet

Instructions

Solve the following problems. Provide your answers using proper notation and show your work for full credit.

Problems

1. a) Find the limit: $\lim_{x \to 2}(3x^2 - 2x + 5)$

    b) Evaluate the derivative: $\frac{d}{dx}(7x^3 - 2x^2 + 4x - 7)$

2. a) Determine the critical points of the function: $f(x) = x^3 - 6x^2 + 9x + 2$

    b) Determine if the critical points are maximum, minimum, or saddle points.

3. a) Find the indefinite integral: $\int (2x^2 - 3x + 4)dx$

    b) Evaluate the definite integral: $\int_0^3 (x^2 - 4x + 5)dx$

4. Find the arc length of the curve given by the parametric equations: $x(t) = 2t^2$, $y(t) = t^3$, for $0 \le t \le 1$.

5. Determine the convergence or divergence of the series: $\sum_{n=1}^{\infty} \frac{1}{n^3}$