

國立屏東教育大學 99 學年度學士班轉學招生考試

微積分 試題

(資訊科學系 / 應用物理系)

*注意事項：(1) 本試題共 1 頁，答案請「橫式」書寫，並依規定上下翻頁，否則不予計分。
(2) 不必抄題，但請依序將題號標出，並寫在答案紙上。

每題 10 分，共 100 分

1. Find the limit $\lim_{x \rightarrow 0} \frac{\sqrt{x+1}-1}{x}$.

2. Find the extrema of $f(x) = 2x - 3x^{2/3}$ on the interval $[-1, 3]$.

3. Find the area of the region bounded by the graphs of $f(x) = 2 - x^2$ and $g(x) = x$.

4. Find the arc length of the graph of $y = \frac{x^3}{6} + \frac{1}{2x}$.

5. Find the interval of convergence of $\sum_{n=1}^{\infty} \frac{x^n}{n^2}$.

6. Find the extrema of $f(x) = \frac{x^2}{x^2 + 3}$ on the interval $[-1, 1]$.

7. Find an equation of the tangent line to the graph $y^2(x^2 + y^2) = 2x^2$ at point $(1, 1)$.

8. Evaluate $\int \frac{1 - \ln(x^2)}{x} dx$.

9. Find the interval of convergence of $\int f(x) dx$, where $f(x) = \sum_{n=1}^{\infty} \frac{(-1)^{n+1} (x-4)^n}{n9^n}$.

10. Find the directional derivative of the function $f(x, y, z) = y^2 + xz$ at point $P(1, 2, 2)$ in the direction of $Q(3, 1, 4)$.