

選擇題

- b** 1. (4%) Let $f(x) = \frac{1}{|x|}$ and $g(x) = x - 1$. Find all values of x for which $f(g(x))$ is discontinuous.
 (a) 0 (b) 1 (c) 0.1 (d) -1.1 (e) None of these
- C** 2. (4%) Find the x -values (if any) for which f is not continuous:

$$f(x) = \begin{cases} \frac{1}{x-3} & , x \leq 5 \\ \frac{1}{2} & , x > 5 \end{cases}$$

 (a) 5 (b) $\frac{1}{2}$ (c) 3 (d) 3,5 (e) None of these
- b** 3. (4%) Find $\frac{dy}{dx}$ if $y^2 - 3xy + x^2 = 7$.
 (a) $\frac{2x+y}{3x-2y}$ (b) $\frac{3y-2x}{2y-3x}$ (c) $\frac{2x}{3-2y}$ (d) $\frac{2x}{y}$ (e) None of these
- b** 4. (4%) State why the Mean Value Theorem does not apply to the function $f(x) = \frac{2}{(x-1)^2}$ on the interval $[-3, 0]$.
 (a) $f(-3) \neq f(0)$ (b) f is not continuous at $x = -1$
 (c) f is not defined at $x = -3$ and $x = 0$ (d) Both (a) and (b)
 (e) None of these
- b** 5. (4%) Let $f(x)$ be a polynomial function such that $f(-2) = 5$, $f'(-2) = 0$, and $f''(-2) = 3$. The point $(-2, 5)$ is a _____ the graph of f .
 (a) Relative maximum (b) Relative minimum (c) Intercept
 (d) Point of inflection (e) None of these
- a** 6. (4%) Evaluate the integral $\int_{-1}^1 |x| dx$.
 (a) 1 (b) 0 (c) 2 (d) -1 (e) None of these
- C** 7. (4%) Evaluate $\int \frac{e^{\frac{1}{x+1}}}{(x+1)^2} dx$.
 (a) $\frac{e^{\frac{1}{x+1}}}{2(x+1)} + C$ (b) $\frac{e^{\frac{-1}{x+1}}}{(x+1)^2} + C$ (c) $-e^{\frac{1}{x+1}} + C$ (d) $\frac{e^{\frac{-x}{x+1}}}{(x+1)^2}$
 (e) None of these
- C** 8. (4%) Find the sum $\sum_{n=0}^{\infty} 3\left(\frac{1}{2}\right)^n$.
 (a) $\frac{3}{2}$ (b) 3 (c) 6 (d) $\frac{50}{9}$ (e) None of these