

銘傳大學 95 學年度轉學生招生考試

電子工程學系

7 月 26 日 第三節

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微積分試題

(限用答案本作答)

(不可使用計算機)

※僅有答案，無適當的理由與計算過程者，以零分計算！

1. The Laplace Transform Form $F(s)$ is defined as; (20 pt.)

$$F(s) = (e^{2s}) \cdot \frac{2s^2 - s + 1}{s^3 + 64},$$

Please find out the Reverse-Laplace Transform, function of $f(t)=?$

2. Please prove that the volume (V) and surface area (A) of a sphere with radius R equal to (20 pt.)

$$V = \frac{4}{3}\pi R^3 \quad \text{and} \quad A = 4\pi R^2$$

3. Please calculate the following Jacobian Coefficients between (X, Y, Z) coordinate and Spherical Coordinate (r, θ, Φ).

$$J = \frac{|\partial(X, Y, Z)|}{|\partial(r, \theta, \Phi)|} \quad (20 \text{ pt.})$$

4. Please evaluate (20 pt)

$$\int \frac{3^{3x} + 3^{2x} - 3^x - 1}{6 \cdot 3^{3x} + 3^{2x} - 5 \cdot 3^x - 2} dx$$

5. Please calculate the following integral: (20 pt)

$$\int_0^{\infty} e^{-x^2} dx = ?$$

試題完