

國立臺北大學 113 學年度日間學士班轉學生招生考試試題

學制系級：資訊工程學系日間學士班 2 年級

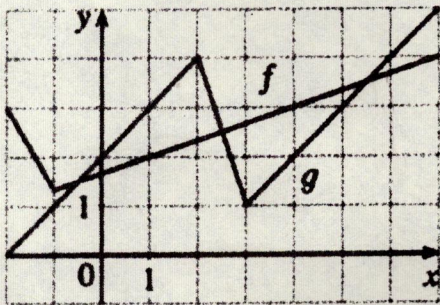
科目：微積分

第1頁 共1頁

可 不可使用計算機

1. (12%) If $F(x) = f(x^3 f(x^3 f(x^3)))$, where $f(1) = 2$, $f(2) = 3$, $f'(1) = 4$, $f'(2) = 5$, and $f'(3) = 6$, find $F'(1)$.

2. (12%) If f and g are the functions whose graphs are shown, let $Q(x) = f(x)/g(x)$ and $C(x) = f(g(x))$. Find (a) $Q'(4)$ and (b) $C'(4)$.



3. (12%) Evaluate $\int_0^1 x\sqrt{1-x^4} dx$

4. (12%) Calculate $\int_0^1 x \tan^{-1} x dx$

5. (13%) Find the solution of the initial-value problem $(\sec x)y' + y = e^{-\sin x}$, $x > 0$, and $y(0) = 2$.

6. (13%) Suppose you start at the point $(0, 0, 3)$ and move 5 units along the curve $x = 3 \sin t$, $y = 4t$, $z = 3 \cos t$ in the positive direction. Where are you now?

7. (13%) Use spherical coordinates to find the volume of the solid that lies above the cone $z = \sqrt{x^2 + y^2}$ and below the sphere $x^2 + y^2 + z^2 = z$.

8. (13%) Let $R(s, t) = G(u(s, t), v(s, t))$, where G , u , and v are differentiable, $u(1, 2) = 5$, $u_s(1, 2) = 4$, $u_t(1, 2) = -3$, $v(1, 2) = 7$, $v_s(1, 2) = 2$, $v_t(1, 2) = 6$, $G_u(5, 7) = 9$, $G_v(5, 7) = -2$. Find $R_s(1, 2)$ and $R_t(1, 2)$.

試題隨卷繳交