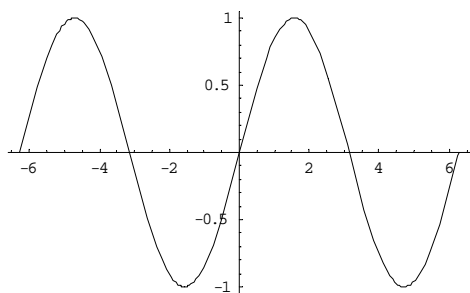


系級：_____ 學號：_____ 姓名：_____

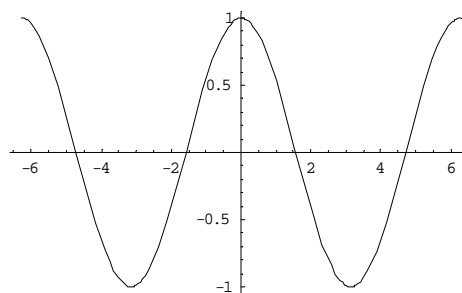
1. 試寫出下列各圖所對應之函數 $f(x)=?$ 並說明該函數之奇偶性。(21%)

(1)



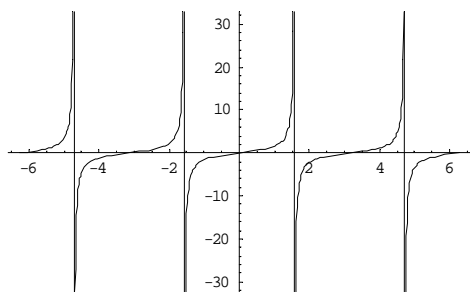
$f(x) = \sin x$, 奇函數

(2)



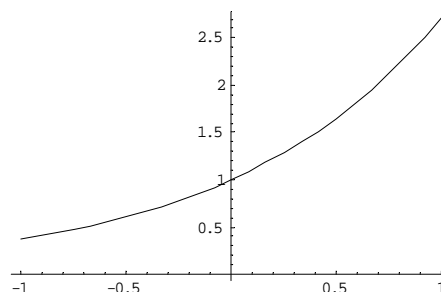
$f(x) = \cos x$, 偶函數

(3)



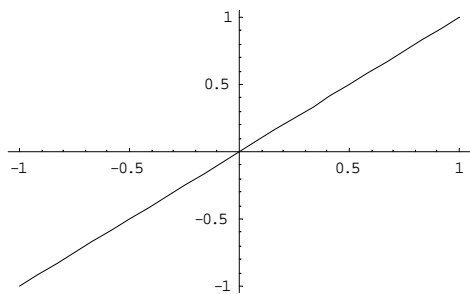
$f(x) = \tan x$, 奇函數

(4)



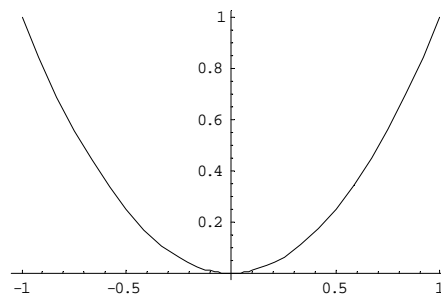
$f(x) = e^x$, 不奇不偶

(5)



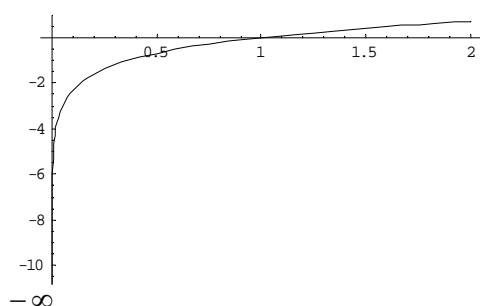
$f(x) = x$, 奇函數

(6)



$f(x) = x^2$, 偶函數

(7)



$f(x) = \ln x$, 不奇不偶

2. (a) $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$ (5%)
 (b) $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$ (5%)

3. (a) $\lim_{x \rightarrow 0} \frac{2e^{2x} - 2}{x} = 4$ (5%)

(b) $\lim_{x \rightarrow \infty} \frac{\ln x}{2e^x} = 0$ (5%)

4. 試求下列各函數 $f(x)$ 的微分 $f'(x) = ?$ (24%)

(a) $f(x) = \sin x \Rightarrow f'(x) = \cos x$

(b) $f(x) = \sin^2 x \Rightarrow f'(x) = 2 \sin x \cos x = 2 \sin 2x$

(c) $f(x) = \sin(x^2) \Rightarrow f'(x) = 2x \cos x^2$

(d) $f(x) = \sqrt{3x^2 - 1} \Rightarrow f'(x) = \frac{3x}{\sqrt{3x^2 - 1}}$

(e) $f(x) = \frac{3x-1}{x^2+3} \Rightarrow f'(x) = \frac{-3x^2+2x+9}{(x^2+3)^2}$

(f) $f(x) = a^x \Rightarrow f'(x) = a^x \cdot \ln a$

5. (a) $\int \frac{1}{3x-3} dx = \frac{1}{3} \ln|x-1| + C$ (5%)

(b) $\int e^{2x} \sin x dx = \frac{1}{5} e^{2x} (2 \sin x - \cos x) + C$ (5%)

6. $\begin{vmatrix} 3 & 3 & 3 \\ 2 & 2 & -2 \\ 1 & -1 & 1 \end{vmatrix} = -24$ (10%)

7. $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} -1 & 3 \\ -2 & 4 \end{bmatrix} = \begin{bmatrix} -5 & 11 \\ -8 & 18 \end{bmatrix}$ (5%)

8. $A = \begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$ 請求出 A^{-1} 。 (10%) $A^{-1} = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$