

微積分 II

考試 1

學號：_____

姓名：_____

得分：_____

總分: 108 分, 考試時間100 分鐘

1. (12%) 計算底下微分式之結果

(a). $\frac{d}{dx} [\arctan(3x)]$

(b). $\frac{d}{dx} \left[8 \arcsin \frac{x}{4} - \frac{x\sqrt{16-x^2}}{2} \right]$

2. (24 %) 計算底下不定積分 (indefinite Integration)

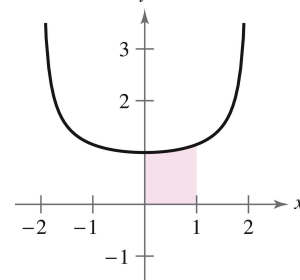
(a). $\int \frac{x-3}{x^2+1} dx$

(b). $\int \frac{dx}{\sqrt{1-4x^2}}$

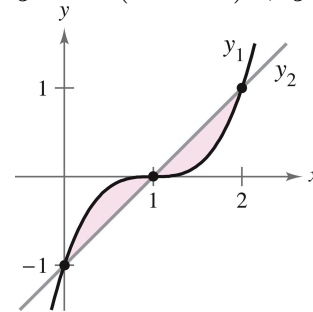
(c). $\int \frac{x}{x^4+2x^2+2} dx$

3. (16 %) 計算底下著色區域面積

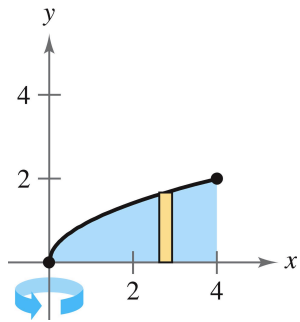
(a). $y = \frac{2}{\sqrt{4-x^2}}$



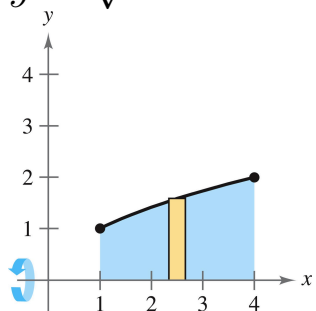
(b). $y_1 = (x-1)^3, y_2 = x-1$

4. (28 %) 依照底下各題中所給**函數與旋轉軸**，計算其依照**旋轉軸**旋轉所產生之**旋轉體體積**

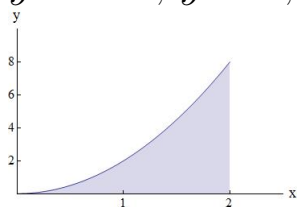
(a). $y = \sqrt{x}$



(b). $y = \sqrt{x}$



(c). $y = 2x^2$, $y = 0$, $x = 2$ 所圍出之面積



i. 旋轉軸: y 軸

ii. 旋轉軸: $y = 8$

5. (16 %) 計算底下函數在其所給區間之弧長 (arc length)

(a). $y = \ln(\cos x)$, 區間 $[0, \frac{\pi}{4}]$

(b). $y = \frac{2}{3}x^{\frac{3}{2}} + 1$ 區間 $[0, 1]$

6. (12 %) 計算底下物體在 x 區間 $[0, \sqrt{2}]$ 之表面積

