

King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
Math 102(12&17) Exam2(B) Spring(042)

ID#: _____ NAME: _____

Sec# _____ Serial# _____

(1) Evaluate each of the following integrals. (45pts)

(i) $\int \frac{dx}{2e^x+1}$.

(ii) $\int \cos^2 \frac{x}{2} \sin^4 \frac{x}{2} dx$

(iii) $\int (\cosh x - \sinh x)^{10} dx$

(iv) $\int \frac{dx}{\sqrt{x^2 - 6x + 13}}$

(iv) $\int (\sin^{-1}x)^2 dx$

(2) The region bounded by the graph of $y = x^2$ and $x = y^3$ is revolved about the line $x = 1$.

Find the volume of the resulting solid. (15pts)

(3) Find the exact arc length of the curve

(10pts)

$$y = \left(\frac{x}{2}\right)^{2/3} \text{ from } x = 0 \text{ to } x = 2.$$

(4) Find the area of the surface formed by revolving about the x-axis the parametric curve

$$x = \sin^2 t, y = \sin t \cos t, 0 \leq t \leq \frac{\pi}{2}. \quad (10\text{pts})$$

(5) Set up the partial fraction decomposition of $\frac{1}{(x^3+1)(x^4-1)^2}$.

(DO NOT CALCULATE THE CONSTANTS) (10pts)

(6) Complete the blanks. (Show your work)

(10pts)

(i) $\coth(\ln x)$ is equal to

(ii) For all real x , $\frac{\operatorname{csch}^2 x}{1+\coth^2 x}$ is equal to

(iii) If $y = (\operatorname{sech} x)(\operatorname{csch} x)$ then y' is equal to

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