University of Calgary
Faculty of Science
Department of Mathematics and Statistics

11.1

Math 249-L05

Fall 2005

Worksheet 12
[More Integration with applications]

1.   Evaluate each of the following definite integrals:

a. $\displaystyle\int_{0}^{1} \frac{x}{\sqrt{x^2+1}}\, dx$

b. $\displaystyle\int_{1}^{2} x\, \sqrt{x^2+1}\, dx$

c. $\displaystyle\int_{\pi/6}^{\pi/3} \sin^2\theta\, d\theta\, dx$

d. $\displaystyle\int_{e}^{e^2} \frac{1}{x}\, (\ln x)^2\, dx$

2.   Determine the area of the region enclosed in each case.

a. $y = \sin\theta;\quad x = \dfrac{\pi}{6};\quad x = \dfrac{\pi}{3};\quad y = 0.$

b. $y = \sin\theta;\quad y = \cos\theta;\quad x = 0;\quad x = \dfrac{\pi}{2}.$

c. $y = x^2 - 4x;\quad y = x.$

d. $y = x^2 - 4x;\quad y = 6 - 3x^2.$

e. $y = e^x;\quad y = e^{-x};\quad x = -1;\quad x = 1.$