

**MATH 2153-006 MIDTERM-I (PRACTICE)**  
**FEBRUARY 17, 2009**

All questions are worth ten points. The maximum possible total is 70. You have approximately an hour and 15 minutes for this exam. Calculators, cell phones, i-pods and other technological gizmos are not allowed!

Question	Marks
Total	

**Question 1.** Evaluate the integral

$$\int \tan^{-1} x \, dx.$$

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**Question 2.** Evaluate the integral

$$\int_0^{\pi/2} \sin^3 x \, dx.$$

**Question 3.** Evaluate the integral

$$\int \frac{x^5}{\sqrt{x^2 + 9}} \, dx.$$

**Question 4.** Write down the partial fraction expansion of

$$\frac{1}{x^4 - 1}.$$

**Question 5.** Evaluate the integral

$$\int e^{x+e^x} dx.$$

(Hint: Try an 'obvious' substitution.)

**Question 6.** Find the length of the curve  $y = 1 + 6x^{3/2}$  for  $0 \leq x \leq 1$ .

**Question 7.** Consider the surface obtained by rotating the curve

$$y = 1/x \quad (x \geq 1)$$

about the  $x$ -axis. Is the area of this surface finite or infinite? Justify your answer.