MAT 1332, Winter 2012 Assignment 1

Due January 25 at the beginning of class.

Late assignments will **not** be accepted; **nor** will unstapled assignments.

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Student Name _____ Student Number _____

By signing below, you declare that this work was your own and that you have not copied from any other individual or other source.

Signature _____

QUESTION 1. Calculate $\int_2^3 x^2 e^{x^3} dx$.

QUESTION 2. Calculate $\int_0^1 \arcsin z dz$.

(hint: integrate by parts first, then use substitution $w = 1 - z^2$)

QUESTION 3. Find the area of the region between the graphs of functions

$f(x) = 3x$ and $g(x) = x^2 + 4x - 2$.

QUESTION 4. Consider the function $f(x) = x^2$ on $[0, 1]$. Partition the interval $[0, 1]$ into five equal subintervals and evaulate

(a) the right-hand Riemann sum, I_R (using the right endpoints);

(b) the left-hand Riemann sum, I_L (using the left endpoints);

(c) $\int_0^1 x^2 dx$;

(d) Compare your answers in (a), (b) and (c). Which Riemann sum underestimates the actual value of $\int_0^1 x^2 dx$, and which Riemann sum overestimates it? Why? (short 1-2 sentence explanation is enough)

QUESTION 5. The region bounded by the curve $y = e^{-x}$ and the x-axis between

$x = 0$ and $x = 1$ is revolved around the x-axis. Find the volume of this solid of revolution.