

MAT 1332, Winter 2012 Assignment 1

**Due January 25 at the beginning of class.**

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

Instructor (circle one): Alexander Hoffnung                      Jason Levy                      Olga Vasilyeva

DGD (circle one):            1                                      2                                      3                                      4

Student Name \_\_\_\_\_ Student Number \_\_\_\_\_

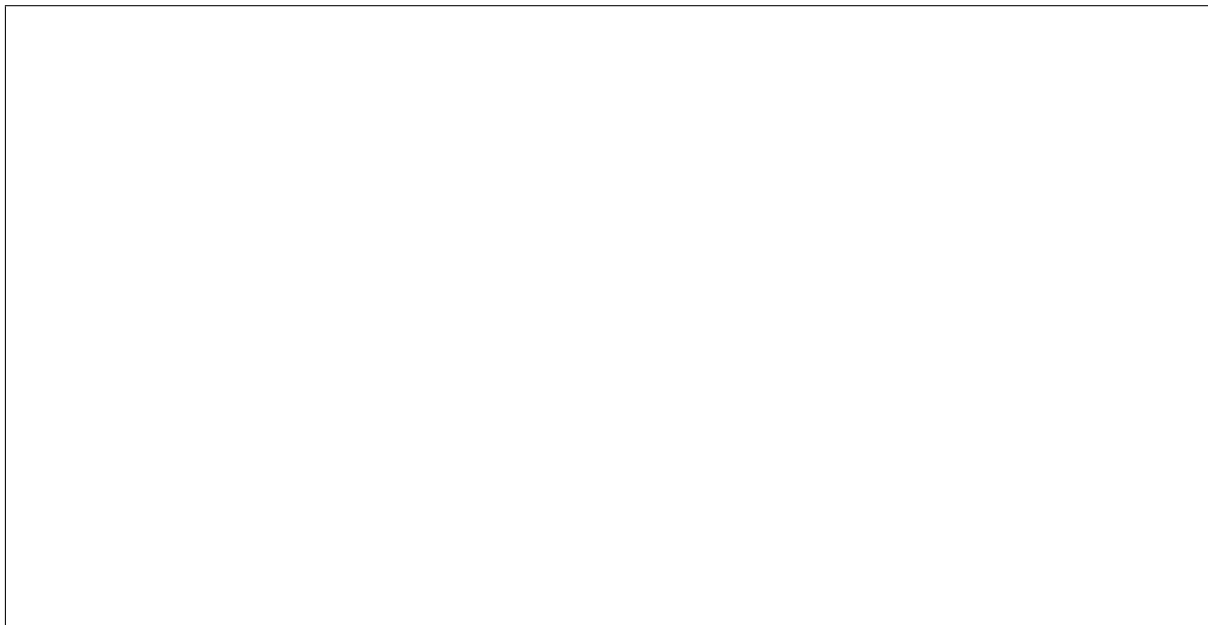
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Signature \_\_\_\_\_

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

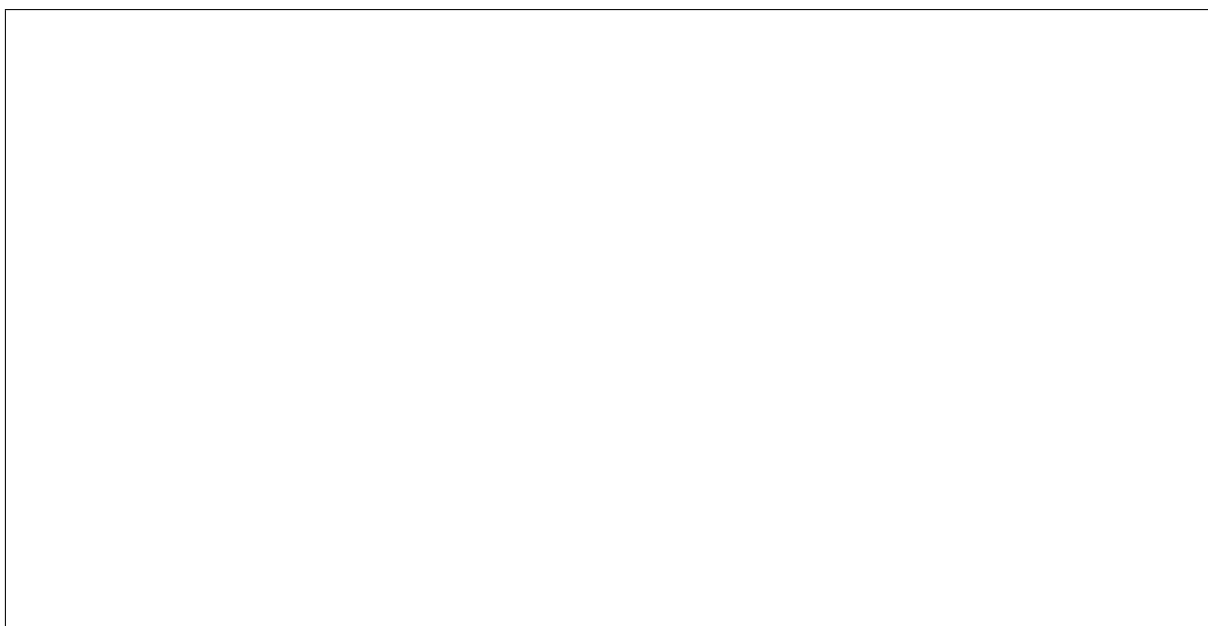
QUESTION 2. Calculate  $\int_0^1 \arcsin z dz$ .

(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

$$f(x) = 3x \quad \text{and} \quad g(x) = x^2 + 4x - 2.$$

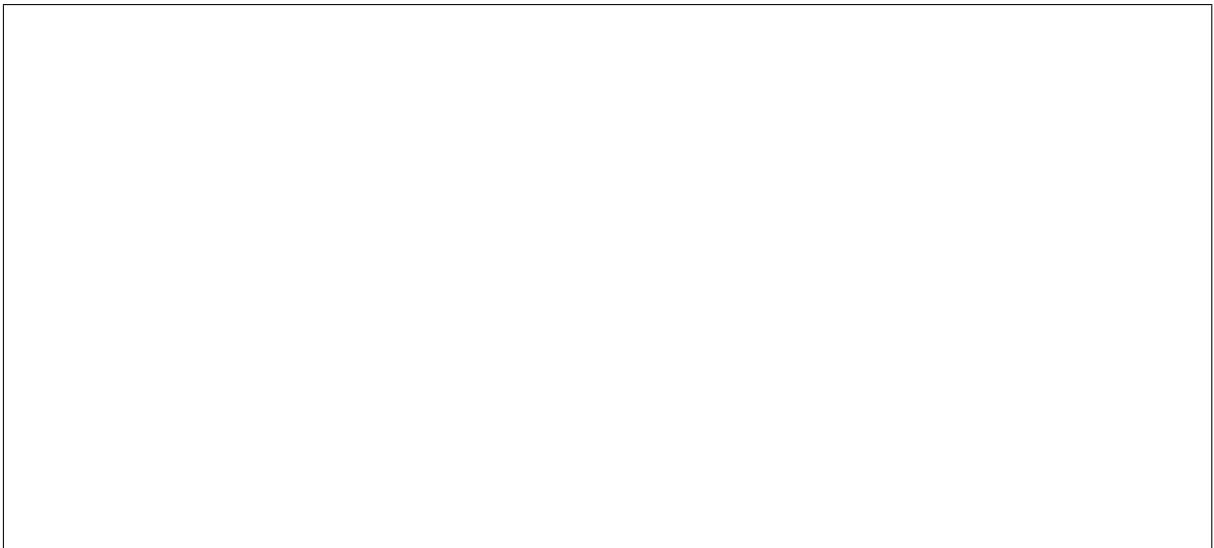


QUESTION 4. Consider the function  $f(x) = x^2$  on  $[0, 1]$ . Partition the interval  $[0, 1]$  into five equal subintervals and evaluate:

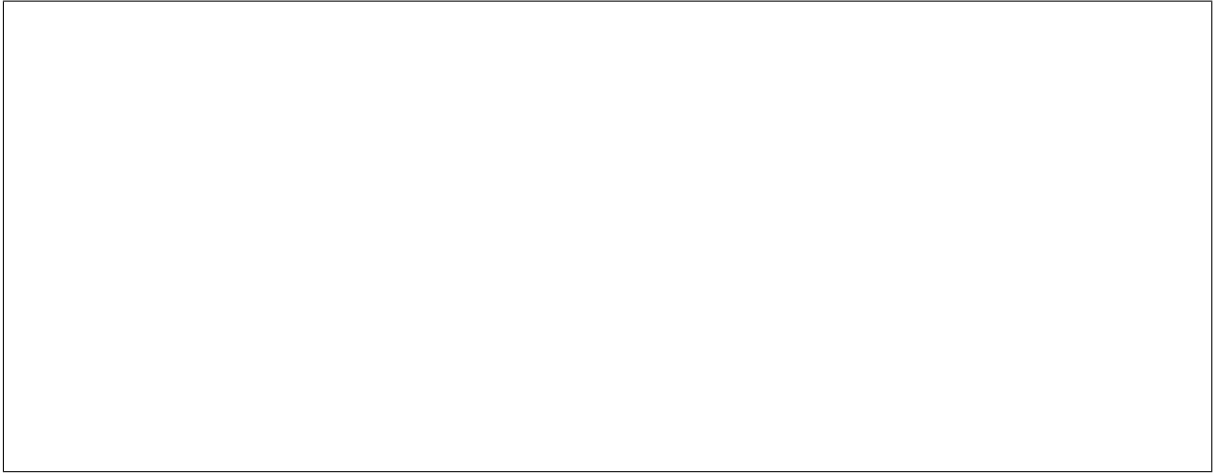
(a) the right-hand Riemann sum,  $I_R$  (using the right endpoints);



(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.

