MAT 1332, Winter 2014, Assignment 1
Due Friday January 17 by 3:00pm.
Late assignments will not be accepted; nor will unstapled assignments.
Professors in the math department will not lend you a stapler; do not ask for one.

Instructor (circle one): Robert Smith? Frithjof Lutscher Catalin Rada

DGD (circle one): 1 2 3 4

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. Find the indefinite integral

$$\int \arcsin(x)dx.$$

QUESTION 2. Find the definite integral

$$\int_0^2 x^5 e^{-x^3} dx.$$

QUESTION 3. Consider the definite integral

$$\int_1^2 \ln(x) dx.$$

(a) Find the value of L_4, the Riemann sum approximation of the integral with four subintervals and function evaluation at the left hand endpoint of each subinterval.

$L_4 =$

(b) Find the value of L_{10}.

$L_{10} =$

(c) Use the fundamental theorem of calculus to calculate the definite integral and compare its value with the two approximations.

Answer:

QUESTION 4. The number of new cases (i.e. change in the total number of cases) during a disease outbreak usually increases at first and decreases later on. One function that describes this behaviour is $f(t) = 100te^{-t/10}$, where t is the time in days since the beginning.

(a) On which day does the number of new cases peak?

Answer:

(b) How many total cases have accumulated by day 10?

Answer:

(c) Find the function that describes the total number of cases on day T.

Answer:

(d) How many cases will there be in total after a very long time?

Answer: