

School of Mathematics and Statistics Carleton University Math. 1004A, Fall 2013 TEST~4

Any non-programmable calculator permitted, 1 blank sheet permitted for roughs

Print Name:

Student Number:

Tutorial Section (A1, A4, \dots):

PART I: Multiple Choice Questions

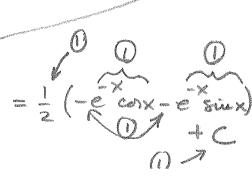
(Choose and CIRCLE only ONE answer - No part marks here.)

- 1. [3 marks] Evaluate $\int_0^1 xe^x dx$.
 - (a) -1, (b) 2, (c) 0, (d) 1, e) none of these.
- 2. [3 marks] Evaluate $\int_{1}^{e} 2 \ln x \, dx$
 - (a) -4, (b) 1, (c) 2, (d) 0, e) none of these
- 3. [3 marks] Evaluate $\int x \sin x \, dx$
 - (a) $\sin x x \cos x + C$, (b) $-2 \sin x + x \cos x + C$, (c) $x \cos x + C$, (d) $-x \sin x + \cos x + C$, e) none of these
- 4. [3 marks] Evaluate $\int_0^1 2x^2 e^x dx$
 - (a) e, (b) 2e 4, (c) e 1, (d) 0, e) none of these
- 5. [3 marks] $\int_{-1}^{1} x e^{-x} dx = -2/e$
 - (a) TRUE, (b) FALSE,

PART II: Show all work here and give details. No additional pages will be accepted

- 6. [5+5 marks] a) Find the most general antiderivative, that is, evaluate $\int e^{-x} \sin x \, dx$.
 - b) Evaluate the definite integral $\int_1^e 3x^2(\ln x)^2 dx$.

a)
$$e^{-x}$$
 sux $I = \int e^{-x} sux dy = (-e^{-x} cox - e^{-x} sux)I$
 $-e^{-x}$ $-cox$ C $+1$
 e^{-x} $-sux$ A A



2 b)
$$I = \int_{3}^{e} 3x^{2}(\ln x)^{2}$$
. $\ln x = t$ $= 0$
 $dx = e^{t}dt = 0$
 $dx = e^{t$

7. [5 marks] Evaluate the definite integral
$$\int_0^1 \operatorname{Arctan} x \, dx$$
.

Arctan \times
 $\int_{1+x^2}^{2} \int_{1+x^2}^{2} \operatorname{Arctan} x \, dx$
 $\int_0^1 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_{1+x^2}^{2} dx$
 $\int_0^1 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_{1+x^2}^{2} dx$
 $\int_0^1 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_{1+x^2}^{2} dx$
 $\int_0^1 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 dx \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \operatorname{Arctan} x \, dx$
 $\int_0^2 \int_0^2 \operatorname{Arctan} x \, dx = x \operatorname{Arctan} x \int_0^2 \operatorname{Arctan} x \, dx$