Introduction to Indefinite Integrals Assessment

Student Name: _____	**Class:** _____
Student ID: _____	**Date:** {{DATE}}

Assessment Details

Duration: 60 minutes	**Total Marks:** 100
Topics Covered:	• Indefinite Integrals • Basic Integration Rules • Polynomial and Trigonometric Functions

Instructions to Students:

1. Read all questions carefully before attempting.
2. Show all working out - marks are awarded for method.
3. Calculator use is permitted except where stated otherwise.
4. Write your answers in the spaces provided.
5. If you need more space, use the additional pages at the end.
6. Time management is crucial - allocate approximately 1 minute per mark.

Section A: Multiple Choice [30 points]

Question 1 [2 marks]

What is the indefinite integral of x^2?

A) $(1/3)x^3 + C$	B) $(1/2)x^2 + C$
C) $x^3 + C$	D) $(2/3)x^3 + C$

Question 2 [2 marks]

Which of the following is a basic integration rule?

A) Power rule	B) Product rule
C) Quotient rule	D) Chain rule

Question 3 [2 marks]

What is the integral of $\sin(x)$?

A) $-\cos(x) + C$	B) $\cos(x) + C$
C) $\sin(x) + C$	D) $-\sin(x) + C$

Question 4 [2 marks]

What is the indefinite integral of $2x$?

A) $x^2 + C$	B) $x^2 - C$
C) $2x + C$	D) $x + C$

Question 5 [2 marks]

Which of the following is the integral of $\cos(2x)$?

A) (1/2)sin(2x) + C

B) (1/2)sin(x) + C

C) sin(2x) + C

D) sin(x) + C

A) (1/2)sin(2x) + C

B) (1/2)sin(x) + C

C) sin(2x) + C

D) sin(x) + C

Question 6   [8 marks]

Evaluate the indefinite integral of 2x^2 + 3x - 1.

Question 7   [8 marks]

Find the integral of cos(2x).

Question 8   [8 marks]

Evaluate the indefinite integral of x^3 - 2x^2 + x - 1.

Question 9   [8 marks]

Find the integral of sin(x)cos(x).

Question 10

[8 marks]

Evaluate the indefinite integral of 3x^2 - 2x + 1.

Question 11 [30 marks]

Evaluate the indefinite integral of x^2 sin(x) and explain your reasoning. Be sure to show all steps and provide a clear explanation of your thought process.

Additional Space for Answers

Basic Integration Rules:

- Power Rule: $\int x^n \, dx = \frac{x^{(n+1)}}{n+1} + C$
- Constant Multiple Rule: $\int a \cdot f(x) \, dx = a \int f(x) \, dx$
- Sum Rule: $\int f(x) + g(x) \, dx = \int f(x) \, dx + \int g(x) \, dx$

Integration of Polynomial Functions:

- $\int x^n \, dx = \frac{x^{(n+1)}}{n+1} + C$
- $\int x^2 \, dx = \frac{x^3}{3} + C$
- $\int x^3 \, dx = \frac{x^4}{4} + C$

Integration of Trigonometric Functions:

- $\int \sin(x) \, dx = -\cos(x) + C$
- $\int \cos(x) \, dx = \sin(x) + C$
- $\int \tan(x) \, dx = -\ln|\cos(x)| + C$