

Integrals — Assignment 1

Class 12 Maths · Topic-wise question bank covering every concept of the chapter · Narayan Gurukul Academy

Instructions: (1) Attempt all questions. This worksheet walks through every concept of the chapter, topic by topic.
(2) The interactive MCQ version of these questions (with instant answer reveal) is available on the notes page.
(3) Universal values: $g = 10 \text{ m/s}^2$ unless stated. Give answers with correct SI units.

Indefinite Integrals and Standard Forms

MCQ Questions (choose the correct option)

- $\int x^n dx$ equals
 - $x^{n+1}/(n+1) + C, n \neq -1$
 - $x^n/n + C$
 - $n x^{n-1} + C$
 - $x^{n+1} + C$
- $\int (1/x) dx$ equals
 - $\log |x| + C$
 - $1/x^2 + C$
 - $x + C$
 - $-1/x^2 + C$
- $\int \cos x dx$ equals
 - $\sin x + C$
 - $-\sin x + C$
 - $\cos x + C$
 - $-\cos x + C$
- $\int e^x dx$ equals
 - $e^x + C$
 - $e^x/x + C$
 - $xe^x + C$
 - $\ln x + C$

1 Mark Questions

- Write $\int x^n dx$.
- Write $\int (1/x) dx$.
- Write $\int \cos x dx$.

2 Mark Questions

- Evaluate $\int (x^2 + 1) dx$.
- Evaluate $\int (3x^2 + 2x) dx$.

3 Mark Questions

- Evaluate $\int (x^3 + 2x + 1) dx$.
- Evaluate $\int (\sin x + \cos x) dx$.

Substitution and Partial Fractions

MCQ Questions (choose the correct option)

- The substitution method is used to
 - simplify the integrand
 - differentiate functions
 - find limits
 - solve determinants
- $\int 2x(x^2 + 1)^5 dx$ is best solved by substituting
 - $u = x^2 + 1$
 - $u = 2x$
 - $u = x^5$
 - $u = x$
- Partial fractions are used to integrate
 - rational functions
 - trigonometric functions
 - exponential functions
 - constants
- $\int f'(x)/f(x) dx$ equals
 - $\log |f(x)| + C$
 - $f(x) + C$
 - $f'(x) + C$
 - $1/f(x) + C$

1 Mark Questions

- When is the substitution method used?
- Write $\int f'(x)/f(x) dx$.
- What are partial fractions used for?

2 Mark Questions

- Evaluate $\int 2x/(x^2 + 1) dx$.
- Evaluate $\int (2x + 1)/(x^2 + x + 1) dx$.

3 Mark Questions

- Evaluate $\int x/(x^2 + 1) dx$.
- Evaluate $\int 1/(x^2 - 1) dx$ using partial fractions.

Integration by Parts**MCQ Questions (choose the correct option)**

- Integration by parts uses the formula
 - $\int u dv = uv - \int v du$
 - $\int u dv = uv + \int v du$
 - $\int u dv = \int u du$
 - $\int u dv = uv$
- For $\int x e^x dx$, we take $u =$

- (A) x
 - (B) e^x
 - (C) $x e^x$
 - (D) 1
3. The ILATE rule is used to
- (A) choose the first function
 - (B) choose the constant
 - (C) find limits
 - (D) simplify fractions
4. $\int \log x \, dx$ equals
- (A) $x \log x - x + C$
 - (B) $x \log x + C$
 - (C) $\log x + C$
 - (D) $1/x + C$

1 Mark Questions

1. Write the integration by parts formula.
2. What does ILATE stand for?
3. Evaluate $\int x e^x \, dx$.

2 Mark Questions

1. Evaluate $\int x \cos x \, dx$.
2. Evaluate $\int \log x \, dx$.

3 Mark Questions

1. Evaluate $\int x^2 e^x \, dx$.
2. Evaluate $\int x \sin x \, dx$.

Definite Integrals and the Fundamental Theorem

MCQ Questions (choose the correct option)

1. The fundamental theorem states $\int_a^b f(x) \, dx$ equals
 - (A) $F(b) - F(a)$
 - (B) $F(a) - F(b)$
 - (C) $F(a) + F(b)$
 - (D) $F(b)/F(a)$
2. $\int_a^a f(x) \, dx$ equals
 - (A) 0
 - (B) 1
 - (C) $f(a)$
 - (D) $2f(a)$
3. $\int_0^{\pi/2} \sin x \, dx$ equals
 - (A) 1
 - (B) 0
 - (C) -1

(D) $\pi/2$

4. $\int_a^b f(x) dx = -\int_b^a f(x) dx$ is a property of

- (A) definite integrals
- (B) indefinite integrals
- (C) derivatives
- (D) limits

1 Mark Questions

1. State the fundamental theorem of calculus.
2. Write the value of $\int_a^a f(x) dx$.
3. Evaluate $\int_0^1 x dx$.

2 Mark Questions

1. Evaluate $\int_0^1 x^2 dx$.
2. Evaluate $\int_0^{\pi/2} \cos x dx$.

3 Mark Questions

1. Evaluate $\int_1^2 (x^2 + 1) dx$.
2. Evaluate $\int_0^{\pi/2} \sin x dx$ using the fundamental theorem.