



Indefinite Integrals

Chapter: Integral Calculus • Level ★★★ • Time: 30 min

SCORE

___ / 20

Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Find general antiderivatives (indefinite integrals).
- ✓ Use an initial condition to determine the constant C.
- ✓ Integrate common functions such as $\cos x$, $1/x$ and $e^{\lambda x}$.
- ✓ Recognise the $+ C$ family of solutions.



Section A • Concept Check

• BEGINNER

 $4 \times 1 = 4$ _____

1 $\int \cos x \, dx = ?$

- ☐ A. $\sin x + C$ ☐ B. $-\sin x + C$ ☐ C. $\cos x + C$
- ☐ D. $-\cos x + C$

2 $\int (3/x) \, dx = ?$

- ☐ A. $3 \ln|x| + C$ ☐ B. $3/x^2 + C$ ☐ C. $3x + C$
- ☐ D. $\ln(3x) + C$

3 If $F'(x) = 4x^3$ and $F(1) = 2$, then $F(x) = ?$

- ☐ A. x^4 ☐ B. $x^4 + 1$ ☐ C. $4x^4$ ☐ D. $x^4 - 1$

4 $\int (8x^3 - 6x) \, dx = ?$

- ☐ A. $2x^4 - 3x^2 + C$ ☐ B. $24x^2 - 6$
- ☐ C. $2x^4 - 6x + C$ ☐ D. $8x^4 - 3x^2$



Section B • Problem Solving

• INTERMEDIATE

 $2 + 3 \times 3 = 11$ _____

5 $\int \cos x \, dx =$ _____

6 $\int (1/x) \, dx =$ _____

7 Find $\int (8x^3 - 6x) \, dx$.

8 Find $F(x)$ if $F'(x) = 4x^3$ and $F(1) = 2$.

9 Find $\int \cos x \, dx$.



Section C • Challenge

• CHALLENGE

5 _____

10 Find $\int (3/x) \, dx$.

Reflection — the most useful thing I learned: _____

A ___/4 B ___/11 C ___/5 Total ___/20

Teacher's Signature _____

Parent's Signature _____

ANSWER KEY — FOLD OR CUT BEFORE HANDING OUT

1-A 2-A 3-B 4-A | 5 $\sin x + C$ 6 $\ln|x| + C$ 7 $= 2x^4 - 3x^2 + C$ 8 $= F(x) = x^4 + 1$ 9 $= \sin x + C$ | 10 $= 3 \ln|x| + C$

