

# Integration as Anti-Differentiation

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name \_\_\_\_\_  
 Date \_\_\_\_\_  
 Class \_\_\_\_\_

## 1. Key Ideas

Differentiation tells us the rate of change of a function. But what if we know the rate of change and want to recover the original function? That process is called integration — or anti-differentiation — and it is the mirror image of everything you have learned so far.

- Integration is the reverse process of differentiation
- Why an indefinite integral includes  $+C$

## 2. Success Criteria

By the end, you should be able to:

- Integration is the reverse process of differentiation
- The power rule for integration
- The meaning of the constant of integration  $+C$

## 3. Key Terms

### Derivative

The rate of change of a function at a point; the gradient of the tangent.

### Differentiation

The process of finding the derivative of a function.

### Stationary Point

A point where the derivative equals zero.

### Chain Rule

A rule for differentiating composite functions:  
 $dy/dx = dy/du \times du/dx$ .

### Product Rule

A rule for differentiating products:  $d(uv)/dx = u(dv/dx) + v(du/dx)$ .

### Chain Rule

The reverse process of differentiation; finding the area under a curve.

## 4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

## 5. Short Answer Questions

1. Explain this lesson goal in your own words: "Integration is the reverse process of differentiation". Use one specific example from the lesson.

**BAND 3** **2 MARKS**

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2. Apply this idea to a new example: "The power rule for integration". Show your reasoning clearly.

**BAND 4** **3 MARKS**

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3. Analyse why this idea matters for understanding Integration as Anti-Differentiation: "The meaning of the constant of integration  $C$ ".

**BAND 5** **4 MARKS**

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## 6. Extend: Apply the Idea

BAND 5/6

5 MARKS

**A student gives a memorised answer about Integration as Anti-Differentiation but does not use evidence or reasoning.**

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

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## 7. Multiple Choice

1. What is the best first step when answering a question about Integration as Anti-Differentiation?

- A. Identify the key concept being tested
- B. Write every fact from memory
- C. Ignore the command word
- D. Skip examples and evidence

2. Which answer would show stronger understanding of Integration as Anti-Differentiation?

- A. An answer with accurate terms and reasoning
- B. A copied definition only
- C. A single-word response
- D. An answer with no example

3. What should you do if a question asks you to explain?

- A. Link the idea to a reason or cause
- B. List unrelated facts
- C. Only draw a diagram
- D. Write the shortest possible answer

## 8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

### SUCCESS CRITERION 1

**Prove that you can: Integration is the reverse process of differentiation**

**BAND 3** **2 MARKS**

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### SUCCESS CRITERION 2

**Prove that you can: The power rule for integration**

**BAND 4** **3 MARKS**

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### SUCCESS CRITERION 3

**Prove that you can: The meaning of the constant of integration  $\$C\$$**

**BAND 5** **4 MARKS**

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**One thing I still need help with:**

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