Trapezoidal Rule

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

Not every function can be integrated exactly. When we only have data points or when the anti-derivative is unknown, we need a reliable way to estimate the area under a curve. The trapezoidal rule replaces the curve with straight-line segments, turning complex areas into simple trapeziums that anyone can calculate.

- The trapezoidal rule formula
- Why the trapezoidal rule approximates area with trapeziums

2. Success Criteria

By the end, you should be able to:

- The trapezoidal rule formula
- How to calculate strip width h
- How to apply the rule to tabulated data

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 × du/dx.

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

Optimisation
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: "The trapezoidal rule formula". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "How to calculate strip width h". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Trapezoidal Rule: "How to apply the rule to tabulated data".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Trapezoidal Rule 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.

7. Multiple Choice

1. What is the best first step when answering a question about Trapezoidal Rule?

- [ ] 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 Trapezoidal Rule?

- [ ] 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: The trapezoidal rule formula

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: How to calculate strip width h

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: How to apply the rule to tabulated data

BAND 5 4 MARKS

One thing I still need help with: