MATHS STANDARD YEAR 11 - MODULE 2 - LESSON 19

The 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

Land blocks, harbours, and paddocks don't have neat rectangular edges. The trapezoidal rule lets you estimate the area of any irregular shape — provided you can measure a set of parallel widths at equal intervals.

- The trapezoidal rule formula: $A \approx \frac{h}{2}(d_f + 2d_m + d_l)$
- Why the trapezoidal rule is needed — real-world shapes are rarely geometric

2. Success Criteria

By the end, you should be able to:

- The trapezoidal rule formula: $A \approx \frac{h}{2}(d_f + 2d_m + d_l)$
- h is the interval between measurements; d_f and d_l appear once; all interior d values appear twice
- The rule gives an approximation, not an exact area

3. Key Terms

Formula
A rule showing the relationship between variables using symbols.

Substitution
Replacing variables with their known values in an equation.

Unit Conversion
Changing a measurement from one unit to another.

Capacity
The amount of liquid a container can hold, measured in litres or millilitres.

Perimeter
The total distance around the outside of a shape.

Area
The amount of space inside a two-dimensional shape.

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: $A \approx \frac{h}{2}(d_f + 2d_m + d_l)$". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "h is the interval between measurements; d_f and d_l appear once; all interior d values appear twice". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding The Trapezoidal Rule: "The rule gives an approximation, not an exact area".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about The 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 The 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 The 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: $A \approx \frac{h}{2}(d_f + 2d_m + d_l)$

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: h is the interval between measurements; d_f and d_l appear once; all interior d values appear twice

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The rule gives an approximation, not an exact area

BAND 5 4 MARKS

One thing I still need help with: