

Areas Between Curves

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 all regions are bounded by a single curve and the x -axis. Sometimes we need the area trapped between two curves — like the cross-section of a pipe, or the gap between two hill profiles. In this lesson, you will learn how to find these areas by integrating the difference between the upper function and the lower function.

- The formula for area between two curves
- Why the integrand is upper minus lower function

2. Success Criteria

By the end, you should be able to:

- The formula for area between two curves
- How to find intersection points to determine limits
- That areas are always positive

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: $d(uv)/dx = u(dv/dx) + v(du/dx)$.

Integration

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 formula for area between two curves". Use one specific example from the lesson.

BAND 3 **2 MARKS**

2. Apply this idea to a new example: "How to find intersection points to determine limits". Show your reasoning clearly.

BAND 4 **3 MARKS**

3. Analyse why this idea matters for understanding Areas Between Curves: "That areas are always positive".

BAND 5 **4 MARKS**

6. Extend: Apply the Idea

BAND 5/6

5 MARKS

A student gives a memorised answer about Areas Between Curves 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 Areas Between Curves?

- 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 Areas Between Curves?

- 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 formula for area between two curves

BAND 3 **2 MARKS**

SUCCESS CRITERION 2

Prove that you can: How to find intersection points to determine limits

BAND 4 **3 MARKS**

SUCCESS CRITERION 3

Prove that you can: That areas are always positive

BAND 5 **4 MARKS**

One thing I still need help with:
