MATHEMATICS ADVANCED YEAR 11 - MODULE 3 - LESSON 2

# Limits

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

What happens to a function as its input gets closer and closer to a particular value? Sometimes the answer is obvious. Sometimes it is hidden behind a division by zero that needs to be untangled. The concept of a limit is the key that unlocks all of calculus — and in this lesson, you will learn how to find it.

- The meaning of limit notation $\lim_{x \to a} f(x)$
- Why a limit can exist where a function is undefined

## 2. Success Criteria

By the end, you should be able to:

- The meaning of limit notation $\lim_{x \to a} f(x)$
- How to evaluate limits by substitution
- How to evaluate limits by factor-and-cancel

## 3. Key Terms

**Sometimes it**
hidden behind a division by zero that needs to be untangled

**limit**
the key that unlocks all of calculus — and in this lesson, you will learn how to find it

**even when the function**
undefined at that point

**WHAT**
A LIMIT?

---

-->

**stationary point**
always a maximum or minimum

**rational function**
dominated by its highest powers

## 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 meaning of limit notation $\lim_{x \to a} f(x)$". Use one specific example from the lesson.**

BAND 3 2 MARKS

**2. Apply this idea to a new example: "How to evaluate limits by substitution". Show your reasoning clearly.**

BAND 4 3 MARKS

**3. Analyse why this idea matters for understanding Limits: "How to evaluate limits by factor-and-cancel".**

BAND 5 4 MARKS

## 6. Extend: Apply the Idea

BAND 5/6 5 MARKS

**A student gives a memorised answer about Limits 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 Limits?

☐ 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 Limits?

☐ 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 meaning of limit notation $\lim_{x \to a} f(x)$**

BAND 3 2 MARKS

**SUCCESS CRITERION 2**

**Prove that you can: How to evaluate limits by substitution**

BAND 4 3 MARKS

**SUCCESS CRITERION 3**

**Prove that you can: How to evaluate limits by factor-and-cancel**

BAND 5 4 MARKS

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