MATHEMATICS ADVANCED YEAR 11 - MODULE 2 - LESSON 11

Graphs of Tangent and Cotangent

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

While sine and cosine trace gentle waves, tangent and cotangent produce a very different pattern: a series of repeating curves separated by vertical asymptotes. In this lesson, you will learn how to sketch these graphs, identify their asymptotes, and understand why their period is only π instead of 2π.

- The shape and key features of $y = \tan x$ and $y = \cot x$
- Why tangent has vertical asymptotes where cosine is zero

2. Success Criteria

By the end, you should be able to:

- The shape and key features of $y = \tan x$ and $y = \cot x$
- The period of tangent and cotangent is π
- The locations of vertical asymptotes for both functions

3. Key Terms

Tangent Curve
The graph of y = tan(x); has vertical asymptotes and period π.

Cotangent Curve
The graph of y = cot(x); has vertical asymptotes and period π.

Asymptote
A line that a curve approaches but never touches.

Period (π)
The horizontal length of one complete cycle for tan and cot.

Undefined
A function value that does not exist, e.g. tan(π/2).

Vertical Asymptote
A vertical line x = a where a function grows without bound.

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 shape and key features of $y = \tan x$ and $y = \cot x$". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The period of tangent and cotangent is π". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Graphs of Tangent and Cotangent: "The locations of vertical asymptotes for both functions".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Graphs of Tangent and Cotangent 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 Graphs of Tangent and Cotangent?

☐ 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 Graphs of Tangent and Cotangent?

☐ 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 shape and key features of $y = \tan x$ and $y = \cot x$

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The period of tangent and cotangent is π

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The locations of vertical asymptotes for both functions

BAND 5 4 MARKS

One thing I still need help with: