MATHEMATICS ADVANCED YEAR 11 - MODULE 2 - LESSON 4

Trigonometric Ratios

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

Engineers designing bridges, pilots navigating flight paths, and architects planning roofs all rely on the same three ratios: sine, cosine, and tangent. In this lesson, you will learn how these ratios are defined from both right-angled triangles and the unit circle, and how to use them to solve real-world problems.

- The definitions of $\sin \theta$, $\cos \theta$, and $\tan \theta$
- How trig ratios connect angles to side lengths in right triangles

2. Success Criteria

By the end, you should be able to:

- The definitions of $\sin \theta$, $\cos \theta$, and $\tan \theta$
- The relationship $\tan \theta = \frac{\sin \theta}{\cos \theta}$
- The Pythagorean identity

3. Key Terms

Trigonometric Ratio
The ratio of sides in a right-angled triangle (sin, cos, tan).

Radian
A unit of angle measure where one radian subtends an arc equal to the radius.

Sine Rule
A formula relating sides and angles in any triangle: a/sinA = b/sinB = c/sinC.

Cosine Rule
A formula for finding sides or angles: $c^2 = a^2 + b^2$ - 2ab cosC.

Period
The length of one complete cycle of a periodic function.

Amplitude
The maximum displacement from the centre line of a periodic function.

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 definitions of $\sin \theta$, $\cos \theta$, and $\tan \theta$". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The relationship $\tan \theta = \frac{\sin \theta}{\cos \theta}$". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Trigonometric Ratios: "The Pythagorean identity".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Trigonometric Ratios 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 Trigonometric Ratios?

☐ 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 Trigonometric Ratios?

☐ 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 definitions of $\sin \theta$, $\cos \theta$, and $\tan \theta$

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The relationship $\tan \theta = \frac{\sin \theta}{\cos \theta}$

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The Pythagorean identity

BAND 5 4 MARKS

One thing I still need help with: