MATHEMATICS ADVANCED YEAR 11 - MODULE 2 - LESSON 5

Exact Values and Special Triangles

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

Calculators are banned in many exam questions for a reason: mathematicians want you to know the exact values. The good news is that you only need two special triangles to find the sine, cosine, and tangent of 30°, 45°, and 60° exactly. Master these two triangles, and you have unlocked half of trigonometry.

- The side ratios of the two special triangles
- Why these two triangles generate all the common exact values

2. Success Criteria

By the end, you should be able to:

- The side ratios of the two special triangles
- The exact values of $\sin, \cos, \tan$ at $30^\circ, 45^\circ, 60^\circ$
- How to use reference angles with exact values

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: $c^2 = a^2 + b^2 - 2ab\cos C$.

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 side ratios of the two special triangles". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The exact values of $\sin, \cos, \tan$ at $30^\circ, 45^\circ, 60^\circ$". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Exact Values and Special Triangles: "How to use reference angles with exact values".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Exact Values and Special Triangles 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 Exact Values and Special Triangles?

☐ 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 Exact Values and Special Triangles?

☐ 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 side ratios of the two special triangles

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The exact values of $\sin, \cos, \tan$ at $30^\circ, 45^\circ, 60^\circ$

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: How to use reference angles with exact values

BAND 5 4 MARKS

One thing I still need help with: