MATHEMATICS ADVANCED YEAR 11 - MODULE 2 - LESSON 8

Complementary Angle Relationships

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

Two angles that add to 90° are called complementary. In a right-angled triangle, the two non-right angles are always complementary — and this creates a beautiful symmetry between sine and cosine, tangent and cotangent, secant and cosecant. In this lesson, you will learn these co-function relationships and how to use them to simplify calculations.

- The complementary angle identities for sine, cosine, and tangent
- Why the co-function identities follow from swapping opposite and adjacent sides

2. Success Criteria

By the end, you should be able to:

- The complementary angle identities for sine, cosine, and tangent
- The corresponding identities for secant, cosecant, and cotangent
- That "co-function" means the function of the complement

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 complementary angle identities for sine, cosine, and tangent". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The corresponding identities for secant, cosecant, and cotangent". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Complementary Angle Relationships: "That "co-function" means the function of the complement".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Complementary Angle Relationships 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 Complementary Angle Relationships?

☐ 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 Complementary Angle Relationships?

☐ 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 complementary angle identities for sine, cosine, and tangent

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The corresponding identities for secant, cosecant, and cotangent

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: That "co-function" means the function of the complement

BAND 5 4 MARKS

One thing I still need help with: