

Reciprocal Trigonometric Functions

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

Every function has its mirror image. For sine, cosine, and tangent, those mirrors are cosecant, secant, and cotangent. These reciprocal functions appear in physics, engineering, and astronomy whenever quantities are inversely related. In this lesson, you will learn their definitions, how to evaluate them, and where they are undefined.

- The definitions of $\csc \theta$, $\sec \theta$, and $\cot \theta$
- Why reciprocal functions have vertical asymptotes

2. Success Criteria

By the end, you should be able to:

- The definitions of $\csc \theta$, $\sec \theta$, and $\cot \theta$
- Where each reciprocal function is undefined
- The relationship between original and reciprocal functions

3. Key Terms

Cosecant

$\csc(\theta) = 1/\sin(\theta)$; the reciprocal of sine.

Secant

$\sec(\theta) = 1/\cos(\theta)$; the reciprocal of cosine.

Cotangent

$\cot(\theta) = 1/\tan(\theta) = \cos(\theta)/\sin(\theta)$; the reciprocal of tangent.

Reciprocal Identity

A relationship connecting a trig function with its reciprocal.

Domain

The set of all input values for which a function is defined.

Range

The set of all possible output values of a 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 $\csc \theta$, $\sec \theta$, and $\cot \theta$ ". Use one specific example from the lesson.

BAND 3 **2 MARKS**

2. Apply this idea to a new example: "Where each reciprocal function is undefined". Show your reasoning clearly.

BAND 4 **3 MARKS**

3. Analyse why this idea matters for understanding Reciprocal Trigonometric Functions: "The relationship between original and reciprocal functions".

BAND 5 **4 MARKS**

6. Extend: Apply the Idea

BAND 5/6

5 MARKS

A student gives a memorised answer about Reciprocal Trigonometric Functions 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 Reciprocal Trigonometric Functions?

- 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 Reciprocal Trigonometric Functions?

- 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 $\csc \theta$, $\sec \theta$, and $\cot \theta$

BAND 3 **2 MARKS**

SUCCESS CRITERION 2

Prove that you can: Where each reciprocal function is undefined

BAND 4 **3 MARKS**

SUCCESS CRITERION 3

Prove that you can: The relationship between original and reciprocal functions

BAND 5 **4 MARKS**

One thing I still need help with:
