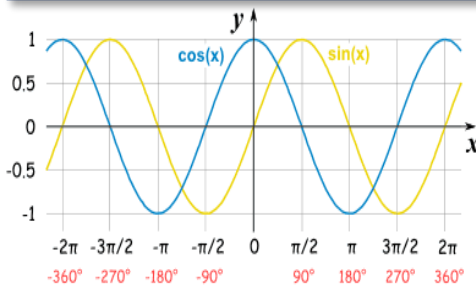


## Goals



By the end of this fortnight, you should be able to:

- Review chain rule, product and quotient rules
- Find the derivatives of trigonometric functions – Sine, Cosine and Tangent.
- Use the class-pad calculators to find the derivatives of trigonometric functions. Set CAS to RAD
- Use derivatives to solve practical problems
- Identify turning points and points of inflection
- Find the second derivative and use this to sketch curves and to solve optimisation problems

## Theoretical Components

### STEP 1

#### Resources:

Maths Quest Year 12 Chapter 7

#### Derivatives of Trigonometric functions

Read and make notes examples 24 - 26

#### Product rule

Read and make notes example 27 and 28

#### Quotient Rule

Read and make notes examples 29 and 30

### Second – Derivative Test

Let  $f'(c) = 0$  and let  $f''$  exist on an open interval containing  $c$ .

1. If  $f''(c) > 0$ , then  $f(c)$  is a relative minimum.
2. If  $f''(c) < 0$ , then  $f(c)$  is a relative maximum.
3. If  $f''(c) = 0$  then the test fails. Use the First Derivative Test.

#### Second Derivative

<https://mathspace.co/teach2/chapter/38966/197>

4/

#### Second Derivative and Concavity

<https://mathspace.co/teach2/chapter/38967/197>

5/

#### Classification of turning and stationary points

<https://mathspace.co/teach2/chapter/38968/197>

6/

#### Optimisation Using Calculus

<https://mathspace.co/teach2/chapter/38970/197>

8/

## Practical Components

### STEP 2

#### Derivative of Trigonometric Functions

Do Exercise 7G

#### Practise Product and Quotient Rules

Do Exercise 7H

Do Exercise 7I

#### Mixed Problems on Differentiation

Exercise 7J Q1 - 3

#### Second Derivative and Concavity

<https://mathspace.co/teach2/chapter/38967/667>

3/

#### Classification of turning and stationary points

<https://mathspace.co/teach2/chapter/38968/668>

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#### Optimisation Using Calculus

<https://mathspace.co/teach2/chapter/38970/670>

7/

## Investigation

### STEP 3

Begin preparing for the test in Week 9.

Have you completed the sketching task from Week 5/6? Can you sketch logarithmic functions?

Complete a summary sheet – one-page A4 handwritten-notes – to be handed up with the test.