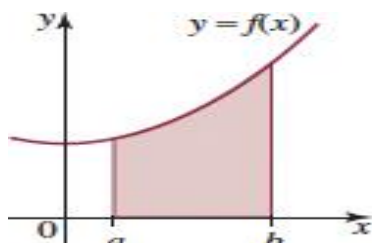


## Goals



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

- Integrate various functions by recognition, various rules and by substitution
  - Integrate various functions using CAS
  - Understand and use integration notation
  - Understand the use of areas of rectangles (and other shapes) to approximate the area under a given curve between defined intervals
  - Understand the use of sigma notation and limits to approximate area under a curve
  - Find an exact area under a given curve using definite integrals
  - Use your CAS calculator to integrate functions and find definite integrals
- <http://www.classpad.com.au/>

## Theoretical Components

- Continue with work set in the homework brief last term - INTEGRATION

### RESOURCES:

- **JacPlus eBook Year 12 Maths Quest Methods Chapter 9**
- **Mathspace.co**
- **Good websites for you to peruse:**

Why do we study integration?

<https://www.intmath.com/integration/integration-intro.php>

Antiderivatives and The Indefinite Integral

<https://www.intmath.com/integration/2-indefinite-integral.php>

The Area Under the Curve

<http://www.rootmath.org/calculus/area-intro>

<https://www.intmath.com/integration/3-area-under-curve.php>

Exact area under the curve using definite integral: The first video is 17 minutes long, but worth the watch.

<https://www.youtube.com/watch?v=WUvTyaaNkzM&feature=youtu.be>

<http://www.youtube.com/watch?v=ODwkt0RMDg&feature=relmfu>

<https://www.youtube.com/watch?v=GtCYrxxTjH4>

<https://www.khanacademy.org/math/ap-calculus-ab/fundamental-theorem-of-calculus-ab/fundamental-theorem-of-calculus-tut-ab/v/fundamental-theorem-of-calculus>

## Practical Components

### Week 12

JacPlus eBook Year 12 Maths Quest Methods

**Exercises 9A, 9B, 9C, 9D and 9E** (Do every 2<sup>nd</sup> or 3<sup>rd</sup> question i.e. 1a, c, e; 2a, c, f; 3 etc).

## Investigation

See next page

- Watch (again)  
<https://www.youtube.com/watch?v=WUvTyaaNkzM&feature=youtu.be>

<https://www.khanacademy.org/math/ap-calculus-ab/fundamental-theorem-of-calculus-ab/fundamental-theorem-of-calculus-tut-ab/v/fundamental-theorem-of-calculus>

- Do your own research 😊



## Week 11 Investigation

Question 1.

Explain the **Fundamental Theorem of Calculus** in your own words. (What does this theorem mean to you and how do we use it.) Use diagrams to assist in your explanation if you need.

Question 2.

1) Draw the curves  $y = x$  and  $y = x^2$  on the same axes and work out the intersection points

2) Do this calculation:  $\int_0^1 x dx - \int_0^1 x^2 dx$

3) Looking at the graphs in 1) and the Equation in 2) - Explain what you have worked out in Q2 in terms of Area?