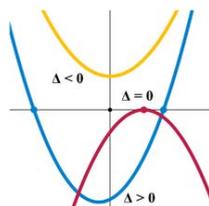


## Goals



sourced: <http://j.mp/lkigfA>

Topic: Functions and Relations. Unit Goal

- understand the concepts of relations and functions
- understand the inter-connectivity of the written, graphical and algebraic forms of relations
- develop mathematical models using various functions;
- use algebraic methods and graphing software to identify the key features of linear and quadratic functions.

This Week

- Quadratic skills (factorising, quadratic formula, completing the square, equations reducible to quadratics)

## Theoretical components

### Factorising Quadratics

There are a number of methods, some you may have learnt in high school. Refresh these by referring to your texts or your high school notes. (2C)

A method that may be new to you is called completing the square. There is an algebraic approach and a geometric approach. Both of these will be described in the lecture this week. (2D)

**Solving equations**, (graphically means finding where the graph crosses the x-axis). This means that the solution to a function, the x-intercepts, the roots and the zeros are all descriptions of the EXACT SAME THING!

Solving quadratics can be done by using

- CAS Classpad (2K)
- Quadratic Formula (2G)
- Graphing and finding the x-intercepts
- fully factorised form (gives the roots easily)

(2E, 2F)

**Discriminant:** the discriminant gives us important information about the solutions a quadratic may have. It tells us the number, the type of roots and the graphical implications for the quadratic. (2H)

**Sum and products of roots of a quadratic:** if

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
 gives us the two roots of a quadratic, using algebra work out the sum and product of the roots. . This link may help with understanding how they are used, <http://j.mp/l6ry0h>.

## Practical components

e-book 11 Math Methods Chapter 2

2C Factorising quadratic expressions

2D Factorising by completing the square

2E Solving quadratic equations

2F Solving quadratic equations

2G Quadratic formula

2H Discriminant

2I Questions 6 and 7

2J Graphs (using your algebraic manipulation skills)

2K Using CAS to solve quadratics

Remember you do NOT need to do EVERY question. Just a couple of each type. Enough to become familiar with the questions, but not too many that you become bored with them. 1/2 hour each night should be plenty to keep the math content fresh in your mind and improve the fluency of your mathematics. (a lot of this should be revision)

## Investigation

Write formal solutions to questions 5 and 6 from set 2K.

## Quiz

Quiz from week 14 is still available; make sure you have completed it.

## Forum

Forum this week - the topic is in three parts.

You need to provide 2 roots and a y-intercept for a quadratic that only you know the formula to. You then need to reply to someone else's post by working out their quadratic equation from their clues. You need to finally, check back regularly to see if a) the reply to your question was correct (provide feedback) and b) see if you were correct from the question you answered. (read your feedback)