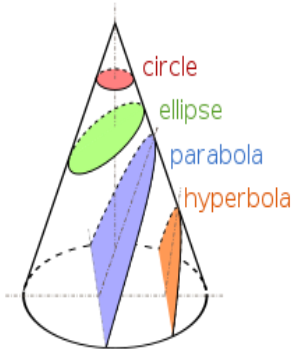


## Goals



By the end of this week, you will:

- Further develop mathematical models with quadratic functions
- Use algebraic methods and graphing software to identify the key features of linear and quadratic functions
- Develop quadratic skills (factorising, completing the square, solving quadratic equations)

Exam: Week 10, 4<sup>th</sup> April at 11:15 am to 1:15 pm in the Gym.

## Theoretical Components

You will need to have a good working knowledge of domain and range, functions and relations for the assignment.

Quadratics:

You need to know about dilation, vertical translation, horizontal translation, vertex, axis of symmetry, reflection, roots, and intercepts

Forms: Base form  $y = x^2$

General form  $y = ax^2 + bx + c$

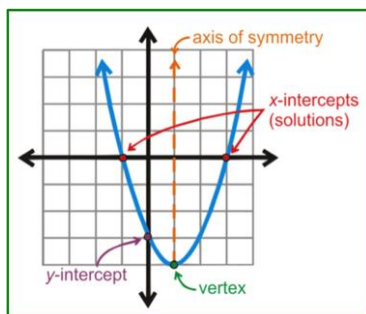
Vertex (h,k) form  $y = a(x - h)^2 + k$

Fully factorised form  $y = (ax - m)(fx - n)$

**Online reading**

Quadratics:

- <https://www.mathsisfun.com/algebra/quadratic-equation-real-world.html>



## Practical Components

**Resources:**

Make notes on the following chapters and websites:

- 2C Factorising quadratic expressions
- 2D Factorising by completing the square
- 2E Solving quadratic equations - Null Factor Law

**Do the following questions:**

Organise your solutions neatly in your exercise book.

Chapter 2 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 2C: 2 (first column), 7 (second column), 9
- 2D: 1i, 2i, 7
- 2E: 2 (first column), 3 (first column), 8, 10, 12

## Investigation

Prepare a two-sided handwritten A4 summary sheet.

Other

**Prepare for your test in Week 10.**

Catch up on any work you have missed.

## Knowledge Checklist:

### Algebra:

- Expanding
- Simplifying
- Collecting like terms
- Rearranging
- Algebraic fractions
- Solving equations and simultaneous equations

### Counting and Probability:

- Understand the addition and multiplication principles for counting
- Compute number of possible arrangements using permutation
- Develop an understanding of factorial notation and apply it to calculating permutations
- Use  ${}^n P_r$  to count number of possible arrangements
- Use combinations to count selections of objects where order is not important; use the  ${}^n C_r$  notations to represent selections where order is not important
- use calculator to compute  ${}^n C_r$  for a given  $n$  and a given  $r$
- Investigate patterns in Pascal's triangle and the relationship to combinations, establish counting principles and use them to solve simple problems involving numerical values for  $n$  and  $r$
- Apply basic probability rules
- Determine the probability of simple and compound events
- Use tree diagrams, Venn diagrams and Karnaugh maps to determine the sample space and probability of compound events
- Use addition principle to compute probabilities of mutually exclusive (and non-mutually exclusive or inclusive) events
- Understand and use the definition of conditional probability
- Use the relative frequency approach to assigning probability to find the conditional probability of an event from a two-way table
- Use the multiplication rule to find the probability of the intersection of two events
- Use the multiplication rule to find the probability of the intersection of more than two events
- Determine if two events are independent

### Linear Modelling:

- Linear functions and modelling
- Know about gradient and features of linear graphs including the y-intercept and the x-intercept.
- Find the intersection of two lines
- Describing functions and relations