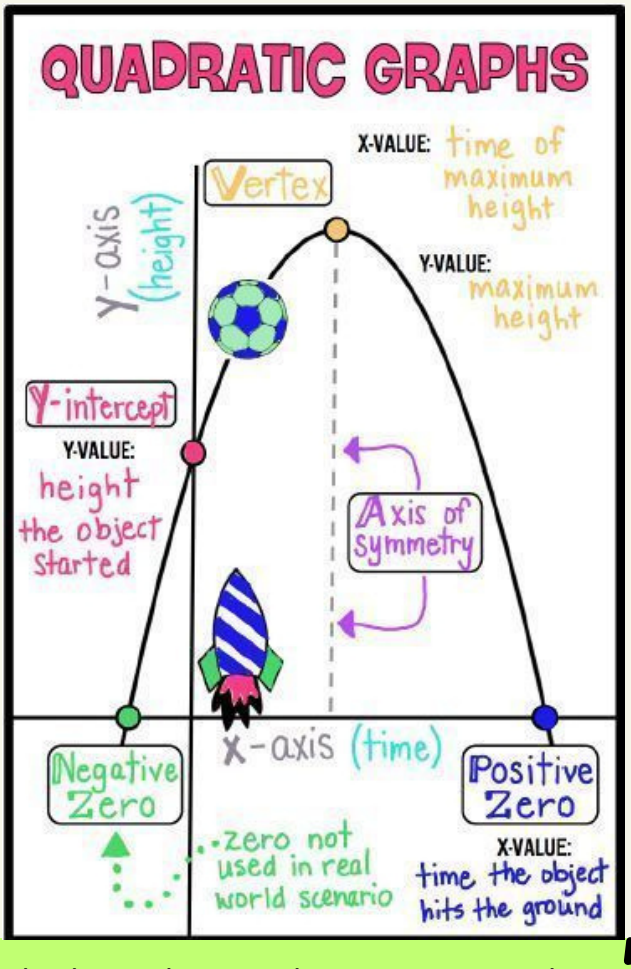
THE OWELET

April 2024 *Official newsletter of Wise Old Owl Tutoring*



QUADRATIC ALGEBRA: A KEY STEPPING STONE TO SUCCESS IN HIGHER LEVEL MATHS

The basic building blocks for understanding formal algebra and communicating using algebra are covered in years 7 and 8 of the Victorian maths curriculum. These include skills such as writing expressions, simplifying, expanding and factoring expressions. Students are also exposed to the Cartesian plane and learn to plot and explore linear and non-linear relationships. They may even have had the opportunity to use technology to explore algebra. The formal teaching of quadratic algebra starts in year 9 with the learning of algebraic techniques such as factoring trinomials, perfect squares and the difference of squares.

This leads to solving quadratic equations and sketching of parabolas. At this stage, it is important to make sure students have a strong knowledge of years 7 to 8 level algebra and number skills in order to progress on to year 10 level maths methods. In order to be successful with year 10 level quadratics, students need to understand quadratics in different ways and be exposed to problems in a variety of contexts. Introduction to technology and using technology in parallel with other methods can only enhance and enrich their learning experiences plus pave the way to confidence in using technology later on.

At year 10 level, students build up on prior knowledge of perfect squares and difference of squares in order to learn factoring, by completing the square. This in turn helps them sketch quadratic functions in turning point form. They will learn how the quadratic formula comes about as well as the different ways a quadratic function can be expressed.

Quadratics will also be the student's first exposure to another important VCE topic called transformations. Looking at parabolas, which are quadratic functions, and how transformations happen can be explored efficiently using CAS technology.

The year 11 maths methods course will be the last time quadratics will be covered in high school. More complex concepts of the discriminant and the number of solutions to a quadratic equation will be discussed. This is again possible if a student understands year 10 learning such as completing the square and the quadratic formula well. In VCE exams, quadratic concepts gets tested more often than any other algebra. For example hidden polynomials in solving exponential equations is a neat and convenient technique to learn. However, it's not just algebra where quadratics gets tested. Often probability questions are based on quadratics.

In summary for anyone intending to do maths methods or specialist maths, quadratics is a very important topic to master and understand well.