

Real Life Applications of Quadratic Equations

- Up to now, we have only been able to solve equations with x 's in them e.g. $5x + 3 = 18$.
- An understanding of Factors allows us to solve more complicated mathematical equations, for example, ones with an x^2 in them.
- Equations with an x^2 in them are called Quadratic Equations and we will be coming across them later on in the course.
- Some uses of Quadratic Equations are outlined below:

1) If you throw a ball, shoot an arrow, fire a missile or throw a stone, it will go up in the air, slowing down as it goes, and then come back down again. Quadratic Equations allow us to calculate where the missile/ball/arrow will be at any point in time. This is useful in the design of military weapons and in particular, missile defence systems on naval warships.



2) The design of any device that has a parabolic shape (a curved shape) like satellite dishes, the lenses in telescopes, lenses used in car headlights, or parabolic mirrors used in dentistry, rely on an understanding of Quadratic Equations. If it were not for Quadratic Equations we might never have been able to watch satellite T.V. or explore the solar system with telescopes!



3) Quadratic Equations are also useful in calculating speeds. Avid kayakers, for example, would need to be able to calculate their speed when going up and down a river. When they have to take the direction of the currents in the river into account, it's a more complicated calculation than it seems and quadratic equations are required!



4) Quadratic equations are also used to model situations and relationships in business, medicine and science. A common use of them in business is to maximise profit, that is, the difference between the total revenue (money taken in) and production costs (money spent).



5) Calculations involving speed, distance, acceleration involve a use of quadratic equations. For example the stopping distances of cars is calculated using quadratic equations, which is definitely of value!!

