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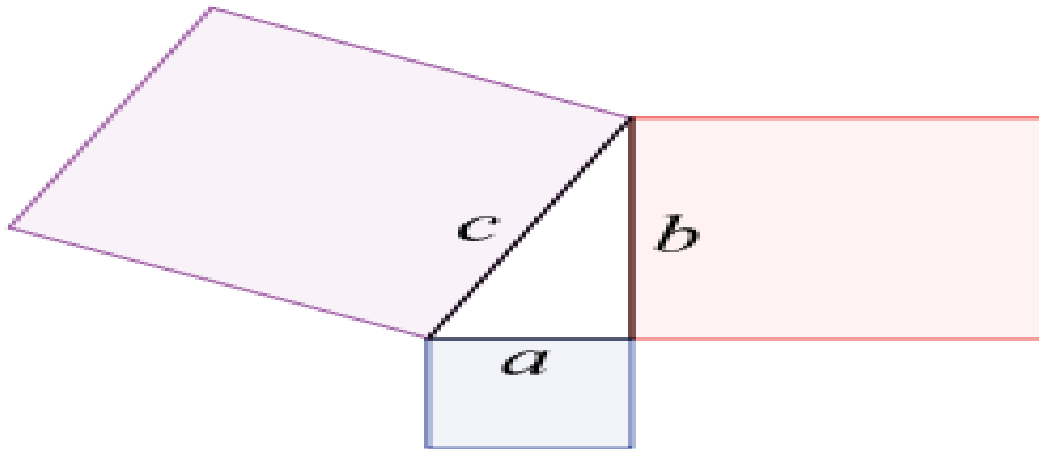
Math 101: Professor Petersen

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### Quadratic

The quadratic equations have dated back all the way to the early 2000 B.C. to the Babylonian mathematicians where they were solving the areas and sides of rectangles. Geometric methods were used to solve quadratic equations in Babylonia, Egypt, Greece, China, and India. These early geometric methods do not appear to have had a general formula. Euclid, the Greek mathematician, produced a more abstract geometrical method around 300 BC. With a purely geometric approach Pythagoras and Euclid created a general procedure to find solutions of the quadratic equation (Smith, David Eugene). Pythagoras established some kind of school or guidelines around 530B.C. in his home which is island called Samos. Many went to Pythagoras school to go on and be great legislators with his political science influence; some include Charondas, the Catanean, Zaleucus, and Timaratus as well as many more (Iamblichus). He made influencing contributions to philosophy and religion. Pythagoras was often talked about as a great mathematician and scientist but he is best known for from his Pythagorean theorem. The theorem can be written as an equation relating the lengths of the sides  $a$ ,  $b$  and  $c$ , often called the "Pythagorean equation". Here is an example of the two squares on the legs  $a$  and  $b$  equals to the square on the line  $c$  or hypotenuse (Judith D. Sally).

$$a^2 + b^2 = c^2$$



It is not for certain if Pythagoras came up with the Pythagorean theorem or if he copied it from someone else or even another mathematician from somewhere else in the world could of came up with it first; but one thing is for certain and that is Pythagoras was the first person to get recorded proof of the theorem.

In elementary algebra, the quadratic formula is the solution of the quadratic equation. There are other ways to solve the quadratic equation instead of using the quadratic formula, such as factoring, completing the square, substitution, or graphing. Using the quadratic formula is often the most convenient way because you can plug your numbers in and be done in just a few steps whereas in factoring, completing the square, and graphing can be at times easier. Not always are these steps the easy way because in completing the square there are a bunch of steps that confuses many people. In the factoring method it does not always work because some equations are not factorable. Substitution is a method were you take two or three equations and subtract them to find one answer then plugging back in to get your other answer(s). By graphing it you would need to put it into  $y=mx+b$  form or complete one of the other steps to find your  $x$  and  $y$  to graph. Although it is difficult for some people to remember the quadratic formula is

usually your best bet because it works every time with every type of quadratic equation. The quadratic formula is basically another form of the standard form  $ax^2+bx+c=0$  it is just has the math done so it simplifies the process down ten whole steps just to remember it. Here is an example of how to take a standard form quadratic equation and turn it into the quadratic formula:

$$1) \quad ax^2 + bx + c = 0$$

$$2) \quad ax^2 + bx = -c$$

$$3) \quad x^2 + \frac{bx}{a} = -\frac{c}{a}$$

$$4) \quad x^2 + \frac{bx}{a} + \frac{b^2}{4a^2} = -\frac{c}{a} + \frac{b^2}{4a^2}$$

$$5) \quad \left(x + \frac{b}{2a}\right)^2 = -\frac{c}{a} + \frac{b^2}{4a^2}$$

$$6) \quad \left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

$$7) \quad \pm\sqrt{\left(x + \frac{b}{2a}\right)^2} = \pm\sqrt{\frac{b^2 - 4ac}{4a^2}}$$

$$8) \quad x + \frac{b}{2a} = \frac{\pm\sqrt{b^2 - 4ac}}{2a}$$

$$9) \quad x = \frac{\pm\sqrt{b^2 - 4ac}}{2a} - \frac{b}{2a}$$

$$10) \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

By using the quadratic formula, you can solve equations with even imaginary numbers this really helps because know there is an answer for everything. Some everyday uses of the Quadratic equation of the quadratic formula consist of graphing charts for businesses, building blueprints to a building, taxes, mapping out points on your gps, and many more is or has to do

with the quadratics. Most people do not even realize that the things they are doing or thinking about doing have a form of the quadratic functions in it.

All in all, the quadratic equations are a really big history behind them dating back to the early days of the 2000B.C. people used the theorems for many things like how many crops they can plant for the space they have and this maximizes crops which makes people more money and also helps people feed the world. Pythagoras uncovered the Pythagorean theorem which is what made him a famous mathematician, he went on to start his own school of philosophy and religion to share his knowledge with the world. Through his school there were many brilliant people that came from there and did many great things Pythagoras even had a big influence on Plato's works. There is some evidence where Plato actually used some of Pythagoras ideas from his science and morals in his mathematics and philosophical. The quadratic formula was great help to the quadratic equations it made thing where you could use imaginary numbers and pretty much use any number to get the right answer. The quadratic formula might be long to remember but it gets the job done and there are songs you can sing to yourself to remember it.

Works cited

Smith, David Eugene (1958). *History of Mathematics, Volume 1*. Courier Dover Publications. p. 134. ISBN 0-486-20429-4. Extract of page 134

Judith D. Sally, Paul Sally (2007). "Chapter 3: Pythagorean triples". *Roots to research: a vertical development of mathematical problems*. American Mathematical Society Bookstore. p. 63. ISBN 0-8218-4403-2

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