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The Dream of Quartic Equation

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Abstract: ***In this paper, we are going to see how I rewrote the quartic equation by using the quadratic formula and as a result of an experiment, let's see what it can do. As the title suggests, that is "The dream of the Quartic Equation", I have tried to change the quartic equation into my dream form. Here, I performed 2 calculations. First one consists of the constant e and the second one doesn't consist of the constant e. After conditioning, we have the quartic equation without x.***

Keywords: Equation: A mathematical expression/statement with an *equal to* sign.
Quartic Equation: An equation with the highest degree of 4.
Cubic Equation: An equation with the highest degree of 3.
Quadratic Equation: An equation with the highest power of 2.
Quadratic formula: A formula that is used to find the variable *x* in any quadratic polynomial.

1. Introduction

In this paper, we are going to see how I rewrote the quartic equation by using the quadratic formula and as a result of an experiment, let's see what it can do. As the title suggests, that is "The dream of the Quartic Equation", I have tried to change the quartic equation into my dream form. Here, I performed 2 calculations. First one consists of the *constant e* and the second one doesn't consist of the *constant e*. After conditioning, we have the quartic equation without x. We can use the equation in several situations but it was just my *experiment*.

2. Work

For first calculation variation; Having the constant 0.

$$ax^4 + bx^3 + cx^2 + dx + e = 0$$

$$(ax^4 + bx^3 + cx^2 + dx) + e = 0$$

$$(ax^4 + [bx^3 + cx^2 + dx]) + e = 0$$

$$(ax^4 + x[bx^2 + cx + d]) + e = 0$$

Since we have common x variable, we are going to put the quadratic formula in it.

But for now, we are solving the inner equation first by observing the quadratic equation nature.

That is; If a=b, b=c and c=d, The quadratic equation will be

$$\frac{-c\pm\sqrt{c^2-4bd}}{2b}$$

$$(ax^4 + x[b\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\}^2 + c\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\} + d])$$

First Complex calculation –

From next page.

$$(ax^4 + \frac{-c\pm\sqrt{c^2-4bd}}{2b}[b\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\}^2 + c\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\} + d]) + e = 0$$

$$(ax^4 + \frac{-c\pm\sqrt{c^2-4bd}}{2b}[b\{\frac{-c^2+c^2-4bd\pm-2c^2\sqrt{c^2-4bd}}{4b^2}\} + c\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\} + d]) + e = 0$$

$$(ax^4 + \frac{-c\pm\sqrt{c^2-4bd}}{2b}[b\{\frac{-4bd\pm-2c^2\sqrt{c^2-4bd}}{4b^2}\} + c\{\frac{-c\pm\sqrt{c^2-4bd}}{2b}\} + d]) + e = 0$$

On having

$$x = \frac{-c\pm\sqrt{c^2-4bd}}{2b} = \frac{p}{q}$$

$$\frac{-4bd\pm-2c^2\sqrt{c^2-4bd}}{4b^2} = \frac{x}{y}$$

We have,

$$(a(\frac{p}{q})^4 + \frac{p}{q}[b\{\frac{x}{y}\} + c\{\frac{p}{2q}\} + d]) + e = 0$$

Here, if it was e=0, it would simply become

$$(a(\frac{p}{q})^4 + \frac{p}{q}[b\{\frac{x}{y}\} + c\{\frac{p}{2q}\} + d]) = 0$$

3. Conclusion

In summary, I have just rephrased the quartic equation using quadratic formulas.

Author Profile

Rishikesh Biswas, a super ordinary 8th grader in India, who has contributed a little to the field of mathematics by doing nothing much by just publishing three research papers (excluding this one) and a book. Besides that, the author plays tabla (Indian Classical Musical Instrument) and has a national scholarship in it from the Ministry of Culture. Author has played chess in nationals as well.