

The Number of Solutions to Quadratic Equations

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

We found that D could tell us the type of solutions we had to:

$$ax^2 + bx + c = 0$$

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

We found that D could tell us the type of solutions we had to:

$$ax^2 + bx + c = 0$$

If $b^2 - 4 \cdot a \cdot c > 0$ then the quadratic equation has

Two distinct Real solutions

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

We found that D could tell us the type of solutions we had to:

$$ax^2 + bx + c = 0$$

If $b^2 - 4 \cdot a \cdot c > 0$ then the quadratic equation has

Two distinct Real solutions

If $b^2 - 4 \cdot a \cdot c = 0$ then the quadratic equation has

One distinct Real solutions, of multiplicity 2

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

We found that D could tell us the type of solutions we had to:

$$ax^2 + bx + c = 0$$

If $b^2 - 4 \cdot a \cdot c > 0$ then the quadratic equation has

Two distinct Real solutions

If $b^2 - 4 \cdot a \cdot c = 0$ then the quadratic equation has

One distinct Real solutions, of multiplicity 2

If $b^2 - 4 \cdot a \cdot c < 0$ then the quadratic equation has

Two Complex solutions, which are complex conjugates

The Number of Solutions to Quadratic Equations

► We defined The *discriminant* of a quadratic: $ax^2 + bx + c$

$$D = b^2 - 4 \cdot a \cdot c$$

We found that D could tell us the type of solutions we had to:

$$ax^2 + bx + c = 0$$

If $b^2 - 4 \cdot a \cdot c > 0$ then the quadratic equation has

Two distinct Real solutions

If $b^2 - 4 \cdot a \cdot c = 0$ then the quadratic equation has

One distinct Real solutions, of multiplicity 2

If $b^2 - 4 \cdot a \cdot c < 0$ then the quadratic equation has

Two Complex solutions, which are complex conjugates

Notice that, if we count multiplicities and complex solutions, there are always Two solutions to a quadratic equation.