The Quadratic Formula

$$-b \pm \frac{\sqrt{(b)^2 - 4ac}}{2a}$$

- The values “a” “b” and “c” are taken from the standard form of a quadratic → $ax^2 + bx + c$
- The easiest way to solve " $ax^2 + bx + c$ =0" for the value of x is to factor the quadratic, set each factor equal to zero, and then solve each x. But quadratics are not always factorable. This is when we can instead use the quadratic formula to solve for x. *We can use the quadratic formula to solve any quadratic for x.*
- Every single term must be on the same side of the equals sign (the other side should ONLY had a 0) so that “a” “b” and “c” are easily identifiable.

Use the Quadratic Formula to solve the following quadratic equations for x.

Ex 1) $x^2 + 2x - 8 = 0$

Ex 2) $2x^2 - 2x - 3 = 0$

Ex 3) $6x^2 + 6x - 1 = 6$

Ex 4) $x^2 + 9x - 60 = -8$

The Discriminant of a Quadratic

Discriminant of a quadratic: this tells us how many solutions we will end up with. The discriminant is $\sqrt{b^2 - 4ac}$, better known as the "square root" part of the quadratic formula

If what is inside of the square root is POSITIVE: $b^2 - 4ac > 0$ **We will have 2 solutions**	Ex) Use the quadratic equation to solve: $x^2 + 6x + 5 = 0$
If what is inside of the square root is ZERO: $b^2 - 4ac = 0$ **We will have 1 solution**	Ex) Use the quadratic equation to solve: $x^2 - 2x + 1 = 0$
If what is inside of the square root is NEGATIVE: $b^2 - 4ac < 0$ **We will have 2 complex solutions**	Ex) Use the quadratic equation to solve: $x^2 - 3x + 10 = 0$