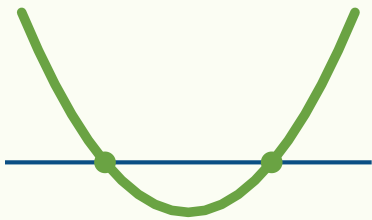




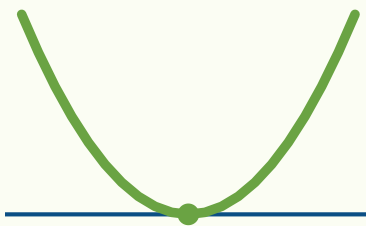
The quadratic formula

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

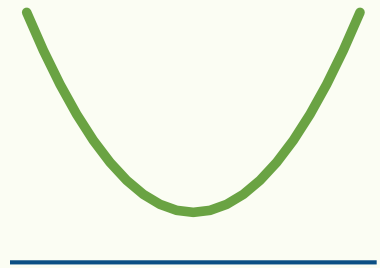
solves $ax^2 + bx + c = 0$ — every one, once it is in that form ($a \neq 0$)



$b^2 - 4ac > 0$
two real solutions



$b^2 - 4ac = 0$
one real solution



$b^2 - 4ac < 0$
no real solutions

$b^2 - 4ac$ is the **discriminant** — the part under the root. Its sign alone says how many real solutions there are, which is why the graph meets the x-axis twice, once, or not at all.