1.8 Use the Quadratic Formula and the Discriminant

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Quadratic formula $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Can be used to solve <u>any</u> quadratic equation $ax^2 + bx + c = 0 \quad a \neq 0$

Solve

$x^2 + 3x = 2$	Set equal to 0
$x^2 + 3x - 2 = 0$	Label a=1 b=3 c=-2 and plug into quadratic formula
$x = \dfrac{-(3) \pm \sqrt{(3)^2 - 4(1)(-2)}}{2(1)}$	Simplify the radical
$x = \dfrac{-3 \pm \sqrt{17}}{2}$	Simplify

Discriminant $b^2 - 4ac$

$b^2 - 4ac > 0$	$x^2 + 6x + 8$	$(6)^2 - 4(1)(8) = 36 - 32 = 4$	2 Real Solutions
$b^2 - 4ac = 0$	$x^2 + 6x + 9$	$(6)^2 - 4(1)(9) = 36 - 36 = 0$	1 Real Solution
$b^2 - 4ac < 0$	$x^2 + 6x + 10$	$(6)^2 - 4(1)(10) = 36 - 40 = -4$	2 Imaginary