

Discriminant

The quantity $b^2 - 4ac$ is called the discriminant of a quadratic function. Does that look familiar? Where does it come from?

When a quadratic function is in the form $0 = ax^2 + bx + c$ you just plug in a, b, and c and the value will tell you about the x-intercepts of the parabola. You may use a calculator for this.

Quadratic function	Value of the discriminant	Type of Solution	Number of unique solutions	Number of unique x-intercepts	Sketch
$0 = x^2 + 2x - 8$ a: 1 b: 2 c: -8	$b^2 - 4ac$ $2^2 - 4(1)(-8)$ $4 + 32$ 36	R, Q Perfect.	2	2	
$0 = x^2 + 6x + 9$ a: 1 b: 6 c: 9	$b^2 - 4(1)(9)$ $36 - 36$ 0	R Perfect	1	1	
$0 = -4x^2 + 3x + 5$ a: -4 b: 3 c: 5	$3^2 - 4(-4)(5)$ $9 + 80$ 89	R	2	2	
$0 = -6x^2 + 5x - 8$ a: -6 b: 5 c: -8	$5^2 - 4(-6)(-8)$ $25 - 192$ $\sqrt{-167}$	Im	2	0	
$0 = 2x^2 + 2x + 13$ a: 2 b: 2 c: 13	$2^2 - 4(2)(13)$ $4 - 104$ $\sqrt{-100}$	I	2	0	

