**6.5 Interpreting Quadratic Equation Roots**

How many solutions (zeros)?

* Put each equation into quadratic formula, what do you notice?

|  |  |  |
| --- | --- | --- |
| Equation | Quadratic Formula | Sketch |
| y = -x2 + x + 6 |  |  |
| y = x2 - 6x + 9 |  |  |
| y = 2x2 - 4x + 5 |  |  |

Based on your findings, how can we quickly check the number of solutions?

In Quadratic Formula,

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

The $b^{2}-4ac$ is called the **Discriminant (D)**. Therefore,

D = $b^{2}-4ac$

* The discriminant gives the number of real solutions to a quadratic equation



|  |  |  |  |
| --- | --- | --- | --- |
| Term | D = $b^{2}-4ac$ | Example | Sketch |
| Two Real Roots | $b^{2}-4ac $> 0 | x2 – 6x + 5 = 0 |  |
| Two Equal Roots (Double Root) | $b^{2}-4ac$ = 0 | x2 + 6x + 9 = 0 |  |
| No Real Roots  | $b^{2}-4ac$ < 0 | x2 – 6x + 13 = 0 |  |

Example 3: Determine the number of real solutions that each equation has:



|  |  |
| --- | --- |
| 1. 0 = 2(x-3)2 + 5

 | 1. 0 = 3x2 + 5x -4

 |
| **HOMEWORK p.349 # 1-5, 7-11****Reading** Examples 1 & 2 on p.346-349 is extra support |