The Discriminant

The computation inside the radical is known as the discriminant. This is sometimes determined first because the value of the discriminant helps us to understand the nature of the solutions to the quadratic equation. When the discriminant is positive, there will be two real-number solutions. When the discriminant is zero, there will be one real-number solution. When the discriminant is negative, there will be no real-number solutions, but rather, two complex-number solutions. But why are these statements true? If you think about it, one must find the square root of the discriminant in the quadratic formula. And the square root of a positive number has two real-number solutions. The square root of zero has one solution, and that's zero. Where as the square root of a negative number has no real-number solutions, but two imaginary-number solutions.

We can consider the quadratic formula written this way when computing the discriminant first. In these examples, I would like to determine the discriminant and nature of the roots first, then solve for X. I like to write down the values for A, B, and C, then compute D. <silent>. Since the discriminant is positive, I know we will have two real-number solutions. We can now identify them very quickly <silent>, and if needed determine the decimal approximations. Please pause the video now and try the last two examples on your own. Resume playback in a moment to check your work. Good Luck!