IIT Madras

ONLINE DEGREE

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Hello, mathematics students. In this week's tutorials, we will look at some questions based on polynomials and the algebra of polynomials. In this question, we have two quadratic equations, which are $p(x)$ and $g(x)$, presumably equal to 0, and they have the roots, $-1 + 1, -5 + 5$ respectively. Then the degree of the polynomial $p(x) \times g(x)$ is three, it is not because you have two quadratic equations, and you are multiplying them.

So, the x^2 terms will have to necessarily multiply, so $(a_1x^2 + b_1x + c_1) \times (a_2x^2 + b_2x + c_2)$, when you multiply these, this term, and this term will have to be multiplied and you are going to get $(a_1a_2x^4)$, so the degree has to be 4, which is this. So, B is correct. And then we have the sum, is equal to, so we need to find the respective quadratic equations now for this, so this would be $(x + 1) \times (x - 1)$, the other would be $(x + 5) \times (x - 6)$.

So, this gives us this is, $x^2 - 1$. And this is essentially $x^2 - x - 30$. So, when we add these two, we get $p(x) + g(x) = 2x^2 - x - 31$. So, C is correct, and that would imply D is wrong. And now we are looking at the difference $p(x) - g(x)$ and that would give us $x^2 - 1 - (x^2 - x - 30)$ =x square minus 1 minus of x square minus x minus 30, which is $x^2 - 1 - x^2 + x + 30$. So, $x^2 - x^2$ cancel off and you have $x + 29$. So, E is wrong and F would be correct.