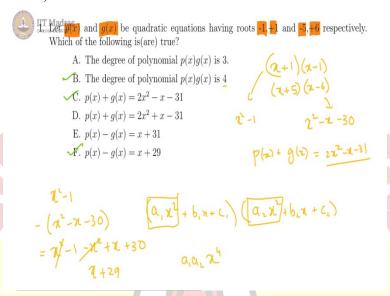


IIT Madras ONLINE DEGREE

Mathematics for Data Science 1 Week 06 - Tutorial 01

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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.