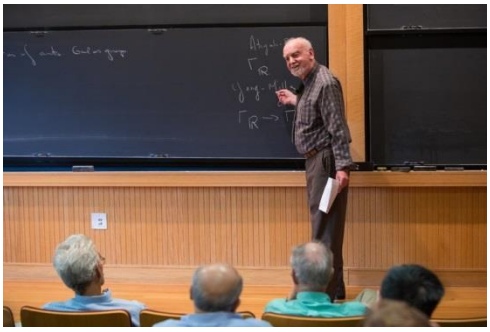
MATH/ALGEBRA FOR PHYSICS

Unit 1 Dr. John P. Cise, Professor of Physics, Austin Community College, Austin Texas & New York Times , March 20, 2018

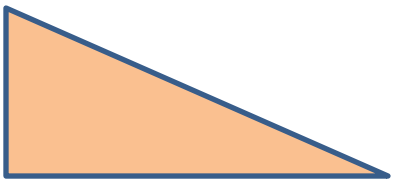
Robert P. Langlands Is Awarded the Abel Prize, a Top Math Honor

By KENNETH CHANGMARCH 20, 2018



INTRODUCTION: Read the last paragraph first.

QUESTION: Give an example of what a,b,c could be when n = 2, so as the equation listed below is true.



Robert P. Langlands, professor emeritus at the Institute for Advanced Study in Princeton, N.J., speaking in the fall of 2016 at a conference centered around his work. CreditDan Komoda/Institute for Advanced Study

In 1967, Robert P. Langlands set out a road map to prove a "grand unified theory" that would tie together disparate areas of mathematics.The conjectures **of Dr. Langland, now 81** and an emeritus professor at the Institute for Advanced Study in Princeton, N.J., have proven fertile ground for mathematical advances in the past half-century. And although his suppositions remain far from fully proven, the Norwegian Academy of Science and Letters announced on Tuesday that Dr. Langlands was this year's winner of the Abel Prize, which many view as a Nobel Prize of mathematics."He's a visionary," said Sun-Yung Alice Chang, a mathematician at Princeton University who served on the five-member prize committee. The panel reviewed more than 100 candidates before selecting Dr. LanglandsThe Abel Prize, first awarded in 2003, honors a lifetime of mathematical work and influence. It is named after Niels Hendrik Abel, a Norwegian mathematician. Previous winners include Andrew J. Wiles, a mathematician now at the University of Oxford who proved Fermat's Last Theorem; Peter D. Lax of New York University; and John F. Nash Jr., whose life was portrayed in the movie "A Beautiful Mind."In an interview in 2010, Dr. Langlands, who was born in New Westminster, Canada, near Vancouver, recalled that even though he skipped a grade, he had no intention of going to college until a teacher "took up an hour of class time to explain to me, in the presence of all the other students, that it would be a betrayal of God-given talents for me not to attend university."At the age of 16, he enrolled at the University of British Columbia, and he later pursued his doctoral studies at Yale. Dr. Langlands made use of this type of analysis in curved spaces of higher dimensions (that is, more than the three dimensions of the world we live in) to address fundamental problems in the theory of numbers.In 1967, Dr. Langlands spoke with André Weil, a prominent French mathematician then at the nearby Institute for Advanced Study, who told him to put his thoughts in writing.The result was 17 pages, handwritten. "After I wrote it I realized there was hardly a statement in it of which I was certain," Dr. Langlands wrote apologetically. "If you are willing to read it as pure speculation I would appreciate that; if not — I am sure you have a wastebasket handy." Dr. Weil had the letter typed up, and it circulated among other mathematicians, becoming what was known as the "Langlands program." Dr. Langlands proved a few pieces of it; others have solved additional special cases.

Dr. Langlands's work, for instance, served as one of the starting points in the proof of Fermat's Last Theorem by Dr. Wiles of Oxford. Pierre de Fermat, a 17th century French mathematician, had asserted that equations of the form $a^n + b^n = c^n$, where a, *b*, *c* and *n* are integers, have no solutions when *n* is greater than two.