J. Ernest Wilkins: His Life and Mathematics

1923- present

Life

Born in 1923, J. Ernest Wilkins, Jr. has been considered by some as having had one of "the most exemplary careers of scholarship and application of an American mathematician/physicist/engineer in the 20th century".

J. Ernest Wilkins, Jr entered the University of Chicago at the age of thirteen and was declared by a newspaper to be "a negro genius." He received his doctorate in mathematics at nineteen and later earned both a bachelor's and master's degree in Mechanical engineering. The title of Wilkin's dissertation was entitled Multiple Integral Problems in Paramagnetic Form in the Calculus of Variations. Wilkins was only the seventh African-American to earn a Ph.D. in Mathematics in the United States.

One example of discrimination faced by Wilkins was that in 1947 when the meeting of the American Mathematical Society was held in Georgia, he was invited to come to the conference and urged to stay with a " nice colored family" where he could take meals. Wilkins has never since attended a meeting of the AMS in the Southeast.

Some of Wilkins' most prestigious honors include being elected a Fellow of the American Association for the Advancement of Science, election to the National Academy of Engineering, Fellow and later President of the American Nuclear Society, chairman of the Army Science Board, Outstanding Civilian Service Medal from the Army. Wilkins helped establish the first doctoral program in mathematics at an historical African-American university in the United States at Howard University. Wilkins has written over 80 mathematical paper and over 20 unpublished but unclassified reports for the atomic energy commission

Mathematics

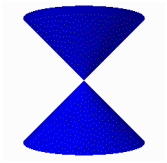
The most important research Wilkins has done in his career has been "the development of radiation shielding against gamma radiation, emitted during electron decay of the Sun and other nuclear resources" [1].

One specific topic on which Wilkins wrote two papers was ruled and cubic surfaces. Ruled surfaces are those which can be created by sweeping a straight line about a curve. They follow the equation x(s,v)=_(t)+v*w(t), t_**I** and v_**R** where _(t) is the curve, and w(t) is the vector which sweeps around the curve. Cubic surfaces are those which are of the form of polynomials of degree three. An interesting fact about cubic surfaces is that each cubic surface contains exactly 27 straight lines.

Identification

Label each surface below as either ruled or cubic. If the surface is ruled, draw the line which sweeps about the curve.

1. Cone

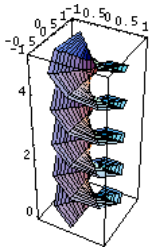


Ruled _____ Cubic_____

2. Cayley surface

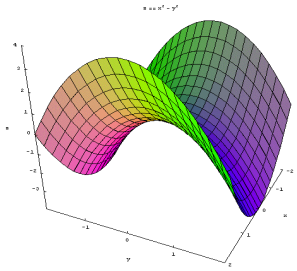
Ruled _____ Cubic_____

3. Helicoid



Ruled _____ Cubic _____

4. Saddle



Ruled_____ Cubic_____

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6. Six Types of Ruled Surfaces [Online]. Available from: http://faculty.fairfield.edu/jmac/rs/sixmodels.htm