



# Math Mole

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A Short Week

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- Today's Editor: Michael
- Tuesday: Alina

### Quotes:

*Proof is an idol before whom the pure mathematician tortures himself.* - Arthur Stanley Eddington, The Nature of the Physical World

### Puzzles:

**Power Play:** A four digit number (not beginning with 0) can be represented by ABCD. Find the only one such that  $ABCD = A^B \cdot C^D$ .

**2001:** Use addition, subtraction, multiplication, division, and parentheses to make the following equation hold.

$$9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1 = 2001$$

You can't use two or more of the digits to make multiple-digit numbers (i.e. solutions like  $(987+6-5+4*3)*2+1=2001$  are not allowed.)

MOTD: On the back

## Mathematician of the Day



Benoit Mandelbrot, b. November 20, 1924, Warsaw Poland

- Mandelbrot was born in Poland in 1924 into a family with a very academic tradition. His father, however, made his living buying and selling clothes while his mother was a doctor. As a young boy, Mandelbrot was introduced to mathematics by his two uncles. Later in life, Mandelbrot married Aliette Kagan.
- Mandelbrot's family emigrated to France in 1936 and his uncle Szolem Mandelbrojt, who was Professor of Mathematics at the Collège de France, took responsibility for his education. In fact the influence of Szolem Mandelbrojt was both positive and negative since he was a great admirer of Hardy and Hardy's philosophy of mathematics. This brought a reaction from Mandelbrot against pure mathematics, although as Mandelbrot himself says, he now understands how Hardy's deep felt pacifism made him fear that applied mathematics, in the wrong hands, might be used for evil in time of war.
- Mandelbrot attended the Lycée Rolin in Paris up to the start of World War II, when his family moved to Tulle in central France. This was a time of extraordinary difficulty for Mandelbrot who feared for his life on many occasions. The war, the constant threat of poverty and the need to survive kept him away from school and college and despite what he recognises as "marvellous" secondary school teachers he was largely self taught.
- After studying at Lyon, Mandelbrot entered the École Normale in Paris. It was one of the shortest lengths of time that anyone would study there, for he left after just one day. After a very successful performance in the entrance examinations of the École Polytechnique, Mandelbrot began his studies there in 1944. There he studied under the direction of Paul Lévy who was another to strongly influence Mandelbrot.
- After completing his studies at the École Polytechnique, Mandelbrot went to the United States where he visited the California Institute of Technology. After a Ph.D. granted by the University of Paris, he went to the Institute for Advanced Study in Princeton where he was sponsored by John von Neumann.
- Mandelbrot returned to France in 1955 and worked at the Centre National de la Recherche Scientifique. In 1958 he left for the United States permanently and began his long standing and most fruitful collaboration with IBM as an IBM Fellow at their world renowned laboratories in Yorktown Heights in New York. He has spoken of how this freedom at IBM to choose the directions that he wanted to take in his research presented him with an opportunity which no university post could have given him. Mandelbrot also was Professor of the Practice of Mathematics at Harvard University, Professor of Engineering at Yale, Professor of Mathematics at the École Polytechnique, Professor of Economics at Harvard, and Professor of Physiology at the Einstein College of Medicine. On June 23, 1999, Mandelbrot received the Honorary Degree of Doctor of Science from the University of St Andrews. He is presently Sterling Professor of Mathematical Sciences at Yale University.
- Benoit Mandelbrot was largely responsible for the present interest in fractal geometry. He showed how fractals can occur in many different places in both mathematics and elsewhere in nature.
- Mandelbrot attributes much of his success to his unconventional, largely self-taught, education.