

# Mathematician of the week

Charles Lutwidge Dodgson

Born: Jan 27<sup>th</sup> 1832 - England

Died: Jan 14<sup>th</sup> 1898 - Guildford, England



(the second picture is a self portrait entitled “me when I’m lecturing”)

Charles Dodgson is best known as Lewis Carroll who wrote Alice’s Adventures in Wonderland. He was born in England in 1832 and he was the eldest of 11 children. His early education was provided by his parents. He read mostly religious books as a child. Charles’ father was a priest who had studied maths at Oxford and Charles wanted to model himself on his father.

Aged 14 he went to Rugby school, he was a shy and nervous child and was very unhappy there however he continued to win lots of prizes for his work. Eventually he got a place at Christ Church, Oxford to read classics and maths. Although he only got a third for classics he got a top first for mathematics.

While he was a lecturer at Oxford he spent lots of time with the Dean’s children, Alice and her sister. It was then that he wrote and invented the Alice in Wonderland stories. He invented the pen name “Lewis Carroll” by translating his first two names “Charles Lutwidge” into Latin as “Carolus Lodovicus”, then anglicising and reversing their order. When Queen Victoria read the two Alice books she summoned her courtier to bring all the other books that Dodgson had written. The courtier returned a few days later with a stack of books. The queen was most surprised to see they were all about mathematics.

Charles Dodgson’s mathematical work was predominantly on geometry and in particular the theories of Euclid (who wrote “The Elements”). Charles Dodgson was also extremely keen on logic and puzzles. Some of these were written down in an anthology called “42 delightfully diverting mind-benders”, puzzles which Dodgson was working on at the time he died. His death was sudden. He contracted a cold in early January 1898 which at first seemed very minor but it developed into a chest problem and his doctor insisted he go to bed. His breathing became more and more difficult and he died at 2.30 in the afternoon of 14 January.

## Dodgson's Quiz

1. Towards the end of his life Dodgson discovered a new fact about square numbers.  
*Double the sum of two squares and it can be expressed as the sum of two other squares.*

Fill in the table below.

First number	Second number	First number squared	Second number squared	Sum of squares	Sum Doubled	2 new squares
2	3	4	9	13	26	1+25
5	8	25	64	89	178	9+169
2	4	4	16	20	40	
3	5	9	25			
4	5					
6	7					
8	9					
2	6					
4	10					
8	11					

2. A logic puzzle.  
You must accept each statement as true. The object is to use all the statements together to produce a single conclusion.
  - a. If I get good grades, then I go to college.
  - b. If I get a good job, then I make a good salary
  - c. If I stay at home, then I study.
  - d. If I go to college, then I get a good job.
  - e. If it is raining, then I stay at home.
  - f. If I study, then I get good grades.
3. Another logic puzzle
  - a. If an animal is in this house, then it is a cat.
  - b. If an animal loves to gaze at the moon, then it is suitable for a pet.
  - c. If I don't avoid an animal, then I don't detest them.
  - d. If an animal is carnivorous, then it prowls at night.
  - e. If an animal is a cat, then it kills mice.
  - f. If an animal takes to me, then it is in this house.
  - g. If an animal is suitable for a pet, then it is not a kangaroo.
  - h. If an animal kills mice, then it is a carnivore.
  - i. If I don't detest them, then animals take to me.
  - j. If an animal prowls at night, then it loves to gaze at the moon.

What is the conclusion which must be reached if all ten of the statements are used?

## Dodgson's Quiz Answers

1.

First number	Second number	First number squared	Second number squared	Sum of squares	Sum Doubled	2 new squares
2	3	4	9	13	26	1+25
5	8	25	64	89	178	9+169
2	4	4	16	20	40	4+36
3	5	9	25	34	68	4+64
4	5	16	25	41	82	1+81
6	7	36	49	85	170	1+169
8	9	64	81	145	290	1+289 121+169
2	6	4	36	40	80	64+16
4	10	16	100	116	232	196+36
8	11	64	121	185	370	289+81 9+361

2. If it is raining, then I stay at home.  
If I stay at home, then I study.  
If I study, then I get good grades.  
If I get good grades, then I go to college.  
If I go to college, then I get a good job.  
If I get a good job, then I make a good salary

Therefore, if it is raining, I make a good salary.

3. If I don't avoid an animal, then I don't detest them.  
If I don't detest them, then animals take to me  
If an animal takes to me, then it is in this house.  
If an animal is in this house, then it is a cat.  
If an animal is a cat, then it kills mice.  
If an animal kills mice, then it is a carnivore.  
If an animal is carnivorous, then it prowls at night.  
If an animal prowls at night, then it loves to gaze at the moon.  
If an animal loves to gaze at the moon, then it is suitable for a pet.  
If an animal is suitable for a pet, then it is not a kangaroo.

Therefore, if I don't avoid an animal then it is not a kangaroo.