

King Edward VI Camp Hill School for Girls

Maths Department Newsletter

14th September 2022

News

As you probably know, Queen Elizabeth II was the longest reigning monarch in

British history, having been queen for over **70** years. But history isn't the only subject interested in kings and queens. There are a lot of interesting



mathematical facts about the Queen. Here are a few statistics. She worked alongside **14** US presidents, **9** popes, and was served by **15** UK Prime Ministers.¹ She was Patron of **626** different charities. In her lifetime, she sent around **50,000** Christmas cards and she had **2** birthdays every year.² She owned **1** elephant, **2** giant turtles, **1** jaguar and **2** sloths, and over **30** corgis. The Queen's Scottish home, Balmoral Castle, on the right bank of the River Dee is **282** metres above sea level. Its grounds cover an area of about **20000** hectares.

The Royal Society

Until her death, Queen Elizabeth II was the Patron of the Royal Society. Founded in **1660** by King Charles II, this is a fellowship of many of the world's most eminent scientists and is the oldest scientific academy in existence. They have recently uploaded a video to YouTube looking at the history of the role that women have played in mathematics. If you would like to watch this, follow the link in the footnote.³

1. Learn this stuff. It's bound to come up in a quiz at some point in your life.

2. Her actual birthday was 21st April but she decided that her official birthday would be moved to a Saturday in June when the weather would be better.

- 3. <u>https://www.youtube.com/watch?v=9Ezq8CX3KVo</u>
- 4. The answer is here: https://www.statista.com/chart/28208/longest-reigning-monarchs-of-sovereign-states/

Queen Elizabeth II died at the age of 96

Maths Word

A **bar chart** is a kind of chart made up of bars that tell you the frequencies of a group of things, such as the number of years the longest reigning monarchs have ruled for. This chart shows the top 4.

Louis XIV 🐞	1643-1715	72 years, 110 days
	Kingdom of France	
Elizabeth II	1952-2022	70 years, 214 days
	United Kingdom & Commonwealth Realms	
Rama IX 🚍	1946-2016	70 years, 126 days
	Thailand	
Johann II 🍟	1858-1929	70 years, 91 days
	Liechtenstein	

Where do you think Queen Victoria, with her **63** years and **216** days would be in this list if it continued?⁴



A moment of tension in the Vatican. If the bishop moves forwards, the queen can take him.



Did You Know?

Queen's College Cambridge has a special bridge called a mathematical bridge. It is called this because of its geometrical construction.



Eight Queens Puzzle

In chess, the gueen is the most powerful piece. It can move any number of squares⁵ in a straight line vertically, horizontally, or diagonally, as long as there are no other pieces in the way. If a piece is in the way,

the queen can take that piece. The eight queens puzzle asks if it is possible to place eight queens on an empty chess board so that none of them threaten to take each other.



It turns out that there are 92 solutions to this puzzle. See if you can find one.⁶

Crown Jewels Puzzle

The King's crown contains three types of diamonds, emeralds gemstone: and sapphires. The number of diamonds is more than twice the number of emeralds. The number of sapphires is less than half the number of emeralds. What is the least possible number of gemstones that could be in the crown?

5. Obviously this number is limited by the size of the board!

7. https://en.wikipedia.org/wiki/Lagrange%27s four-square theorem

Queen of the Sciences?

The famous mathematician Carl Gauss said that "Mathematics is the gueen of sciences Number Theory and is the queen

of mathematics." Number Theory is the part of maths that deals mostly with the properties of positive numbers. whole For example, did you know



that every odd prime number is either one more or one less than a multiple of four? This is an idea from Number Theory. Did you also know that every positive whole number can be made by adding together the squares of no more than four other whole numbers? This is called Lagrange's Four Square Theorem.⁷ The thing is though, maths and science are really very different in the way that they work. In science, a theory is considered true if it is based on a body of facts that have been repeatedly confirmed through observation and experiment. This is not how maths works. In maths, an idea is considered true if it can be proved using a logical argument. We call these ideas that have been proved 'theorems'. It doesn't matter how much experimental evidence a mathematician might gather to support an unproven mathematical conjecture. For example, you can never prove that there are an infinite number of prime numbers by just counting more and more prime numbers because you never know if the one you just counted was the last one. So, was Gauss right? Could maths be the queen of the sciences without being a science? Like Queen Elizabeth II was the Queen of several countries without actually being a country? What do you think about this?

^{6.} If you can't, you can look here: https://en.wikipedia.org/wiki/Eight queens puzzle