



In 1968 it took 88 minutes to decide the winner of the ESC; this year it took 227

### News

This weekend saw one of the biggest television events of the year take place in Rotterdam, The Netherlands, after taking its first year off since it began in 1956; I am of course talking about the Eurovision Song Contest. The ESC is an international music contest that takes place somewhere in Europe each year where each nation is allowed to send their best<sup>1</sup> music talent. Now you may be thinking what is a cheesy music competition doing in our maths newsletter, but actually the contest itself does involve more maths than you might think<sup>2</sup>! After all 26 finalists have performed their 3 minute song, each with a maximum of 6 performers on the stage, the 39 entrants get to vote for their favourite song of the evening. Each country is allowed to award a total of 58 points to their 10 favourite songs with the famous 'Douze points' going to their favourites before giving 10 to second then 8 to 1 for third to tenth. The process of handing out these points often takes a while, especially now each country is allowed to give these points out twice, once from a musical jury and once from viewers at home, but after a near 4-hour show Italy's Måneskin were finally announced as the winners of Eurovision 2021 with their song *Zitti e buoni* scoring 524 points.



### 'Nul Points'

'Nul points' is an infamous part of Eurovision and it does not happen all that often. Since the latest update in the voting system in 2016 it had been considered 'impossible' for a country to receive zero points; until Saturday. You may have seen that James Newman, the UK entry, managed to achieve the feat at the contest this year, so let's have a look at how 'impossible' this outcome actually was. Last time the UK received zero points was in 2003 where 25 other countries voted on their favourite song with each able to award 10 lots of points to their favourite countries, 250 opportunities in total. According to probability, achieving 'nul points' had a  $2.84 \times 10^{-6}$  chance of happening<sup>3</sup>. This year 38 countries voted and each country was able to give 20 lots of points to their favourite songs; obviously having 760 opportunities makes it much less likely to happen, in fact the chance of us getting 'nul points' this year was  $2.66 \times 10^{-17}$ . Maybe we have achieved the impossible, or was our song just 100 million times worse than 2003? Check them out by clicking here; [2003](#) & [2021](#)



### Did You Know?

The first time a country scored 88 points in the Eurovision Song Contest was the 1988 edition hosted in Dublin, Ireland.

1. This is sometimes debatable! Here is a link to a Eurovision classic to help with 'making your mind up'!  
<https://youtu.be/hfjHJneVonE>
2. Plus, as it is Mr Hamblett's favourite week of the year it was easy for Mr Taylor to get him to write a newsletter.
3. These probabilities rely on points being given at random; nothing can stop a bad song actually receiving 'nul points'!!!

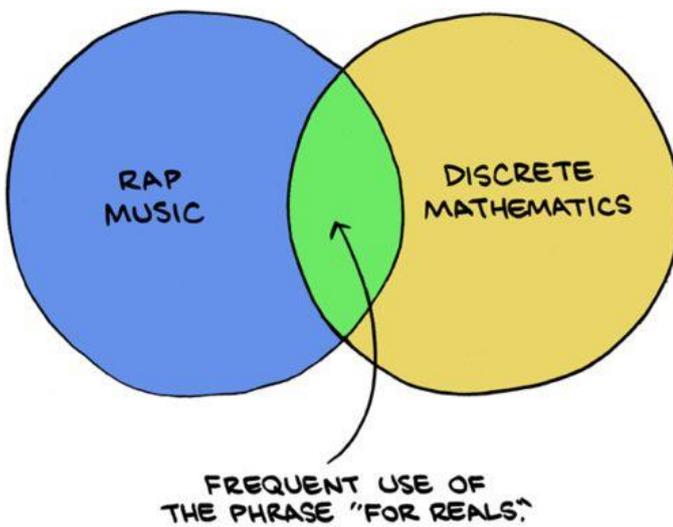
## The Eurovision 2021 Logo



At Eurovision this year it wasn't just the scoring that was of mathematical interest, the logo itself was a mathematical representation of Europe coming together. The logo placed Rotterdam, the host city, at the centre of a circle with coloured rays coming from it. The rays all represent the direction and distance that each competing nations' capital is from the host city, with each ray comprising of two colours from the nation's flag. The

distances aren't particularly precise, the large blue section in the bottom right represents Australia<sup>4</sup> which is more than 5 times the distance from Rotterdam as Cyprus, the orange section below it, but the direction is more accurate. The designers have created the logo by splitting the circle into 36 sections and used the bearing<sup>5</sup> of each capital from Rotterdam rounded to the nearest 10 to create the direction of each ray. You may wish to try to identify the countries represented in this logo; there are 41 flags to spot in total and each ray may represent more than one nation by having up to 4 different sections of differing lengths, although not all of these are obvious!

### Joke



### Eurovision Fact

There have been 68 winners of Eurovision in 65 contests, as in 1969 there was a four way tie for first place and they did not have a tie break rule. This is no longer the case and there will always be just one winner.

### A ESC Puzzle

Here is a Eurovision themed puzzle written by famous maths teacher Bobby Seagull.

At Eurovision, entries from France, Germany, Spain, Italy and the United Kingdom are guaranteed places in the final every year. With the following theoretical song choices, why might only the UK entry get the infamous nul points?

France's song is "*Can humans only imagine roads?*"

Germany's song is "*Very original ice cream eggs.*"

Spain's song is "*Super clever aliens learn eternally.*"

Italy's song is "*Love you really in colour.*"

The UK's song is "*Animal zoos exert regal opulence.*"

Can you work out what this is about?

4. Yes, Australia is not in Europe, but actually that is not a requirement to be part of Eurovision - you only need to be a member of the European Broadcasting Union.

5. If you haven't heard of these yet, then you will have that to look forward to in year 9!