FUNBERS
22, 23 AND 24

Text: Tom Crowford
Photos: Hedi Slimane

The fun facts about numbers that you didn't realise you've always wanted to know...

22 – TWENTY-TWO

Coming in hot, 22 happens to be one of my favourite numbers – if you divide it by 7 you get about 3.142, which is a handy way of getting close to pi without having to remember all the digits! Then of course there's Joseph Heller's famous novel Catch-22. In the book, Catch-22 is the Air Force policy which says that bomber pilots can only stop flying planes if they are declared insane. But like the name suggests, there's a catch. Catch-22 says that asking for a mental evaluation to get declared insane is proof that you aren't in fact insane. So technically, there's a way to get out of flying more bombing runs... but if you try it, you get sent right back out in the next plane!

Twenty-two also pops up in the kitchen. Normally, if you are slicing a pizza using 6 cuts, you'd do it neatly and end up with 12 even slices – much like the numbers on a clock face. But if you were a lazy pizza chef and just sliced randomly, you could end up cutting slices in half and ending up with more pieces. And it turns out, the most pieces you can end up with after 6 cuts is, you guessed it, 22!

On a darker note, 22 was also the lucky number of the Haitian voodoo dictator Francois "*Papa Doc*" Duvalier. Papa Doc started studying voodoo folklore to spread rumours that he had supernatural powers, which let him rule through fear. But eventually, he started believing the rumours himself. He would only go outside his palace on the 22nd of the month, because he thought he was guarded by voodoo spirits on that lucky day. He even claimed to have killed JFK, whose assassination was on the 22nd of November 1963, supposedly by stabbing a voodoo doll of him 2222 times that morning...

23 – TWENTY-THREE

For 23 we're going back to maths, and specifically prime numbers. A prime number remember, is one that can only be divided by itself and one without giving any remainder. Twenty-three has the unique property of being the smallest prime number which is not a *'twin prime'* – that is a prime number which does not have another one within two spaces of it on the number-line. For example, 3, 5 and 7 are all close friends, while 11 and 13 go together. 17 is next to 19, but the nearest prime number to 23 is either four places below at 19, or six places above at 29, making it the smallest prime number to not have the *'twin'* property.

Twenty-three is also big for birthdays. Not because the age of 23 is particularly special *(although being the age mentioned in my favourite song – Blink 182's 'what's my age again?' – I do have a soft spot for it)*, but because of its appearance in the *'Birthday Paradox'*. The complete explanation is a little too long for Funbers, but in short it says that if you choose 23 people at random and put them in a room together, there is a greater than 50% chance that 2 of them share the same birthday. If that sounds too crazy to believe, check out a full explanation here from one of my students who applied it to the 23-man England squad for the 2018 Football World Cup. *Now to enjoy some classic pop punk: "Nobody likes you when you're 23..."*

24 – TWENTY-FOUR

Who remembers Avogadro's constant for the number of atoms contained in one mole of a substance from high school Chemistry? No, me neither. But, a great way to approximate it is using 24 factorial – or 24! in mathematical notation. The factorial function *(or exclamation mark)* tells you to multiply all of the numbers less than 24 together. So, 24! is equal to 24 x 23 x 22 x 21 x 20 x 19 x ... x 2 x 1, also known as an incredibly large number. It's about 3% larger than Avogadro's constant, but certainly easier than remembering 6.02214076 x 1023.

Twenty-four also represents the number of carats in pure gold, the number of letters in the Greek alphabet *(ancient and modern)* and the number of points on a backgammon board. Mathematically, 24 is the smallest number with exactly 8 numbers that divide it – can you name them? *And, it's equal to exactly 4 factorial:* 4! = 4 x 3 x 2 x 1 = 24. Last but not least, where would we be without the 24 hour day – or to be precise 24 hours plus or minus a few milliseconds to be completely exact...

Dr. Tom Crawford,
Creator of tomrocksmaths.com,
YT/FB/Twitter/IG: tomrocksmaths,
Naked Mathematician, University of Oxford.