



All powers of 76 end with the digits 76

News

Sometimes you can find mathematical ideas in unexpected places. For example, in the popular TV show Peppa Pig there is plenty of maths if you look for it. Here's a little puzzle to get us started.



In 7 years' time, Peppa Pig will be three times as old as she was last year. How old is she? In 7 years' time, her little brother George will be 5 times as old as he was last year. How old is he?

Daddy Pig is 28 years old now. How old will Peppa and Daddy Pig be when Daddy Pig is exactly twice as old as Peppa?

Did You Know?

76 is quite an interesting number because it shares with 25 the property that all powers of 76 end with the digits 76.¹ 25 and 76 are the only two 2-digit numbers that behave in this way.² Can you find any 3-digit numbers that behave in this way?



Congratulations

Well done to Maddy Kane, Maya Patel and Kanakdurga Nanda, who took part in the Maths Olympiad for Girls. Kan scored one of the highest marks in the country. Also, well done to Iqra Saleem, Kiera Fernandes, Sahana Jain, and Sarah Badenhorst, who all won prizes in this year's University of Southampton Mathematics Challenge.

Maths Game

Did you know there is a mathematical game called Pig? Here are the rules:

Pig is a game for two or more people, although it is usually played in pairs. You will need a dice.



The first player rolls the dice as many times as they like, adding up the total as they go.

If, however, a 1 is thrown, all their points for that round are lost. The player may stop at any time and put their score in the bank. Their banked score cannot be lost.

When a score has been banked, the dice is passed to the next player, who then has their turn.

The winner is the first player to reach 50 or more.

Is there a mathematical strategy for winning this game?

Joke

What do you call a parrot who has forgotten to eat their lunch?

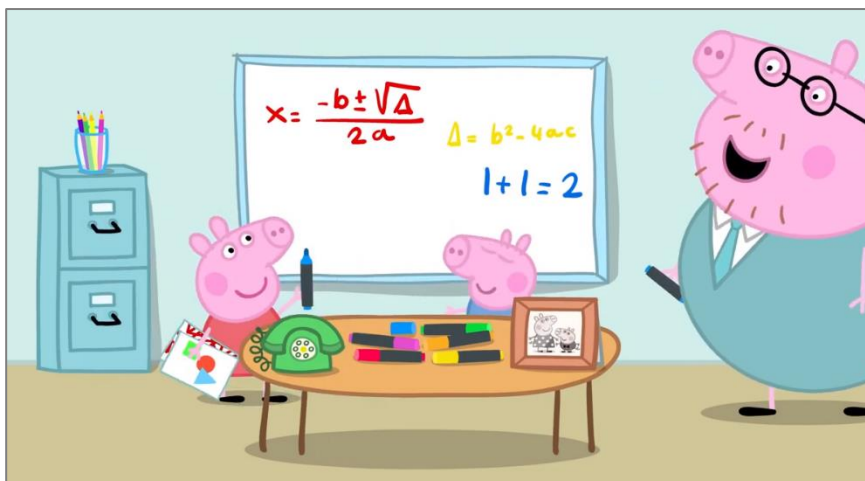


A polly-no-meal³

1. Obviously the powers of 25 end with 25, not 76. English sentence structures can sometimes be tricky!
2. You can prove that 76 behaves this way using something called proof by induction.
3. You can watch the episode *Polly Parrot* here: https://www.youtube.com/watch?v=V00jUKp0_rg

The Quadratic Formula

Daddy Pig's job is really quite complicated. He is a structural engineer. He described what he does as 'taking big numbers, transmuting them, then calculating their load-bearing tangents.' This looks like it involves using the quadratic formula, as it is written on his whiteboard in his office at work.⁴



Dropping a Stone or Falling out of a Plane

In the Peppa Pig episode *Caves*⁵, Grampy Rabbit drops a stone down a very deep hole that Daddy Pig and his family are going to have to cross over.

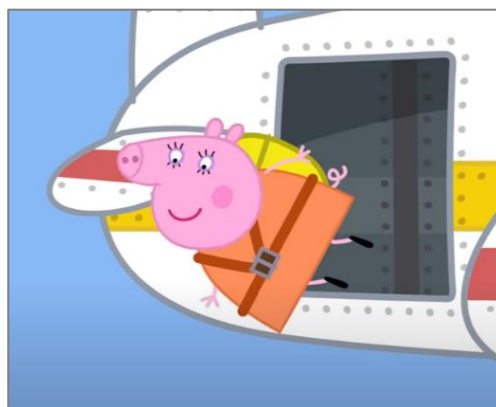


Did you know that you can work out how deep the hole is by timing how long it takes for the stone to reach the bottom?

To get a rough idea of how deep the hole is, count the number of seconds the stone takes to hit the bottom, square this number, then multiply your answer by 5. This will give you the approximate depth of the hole in metres. You can use this method to measure the height or depth of pretty much anything. Just make sure you don't drop a stone onto anyone's head!

It used to be thought, thanks to a Greek philosopher called Aristotle, that heavier things fell at a faster rate than lighter things. It is easy to be misled into thinking this is true because light things often fall more slowly because of air resistance. If you ignore air resistance though, all things will fall at the same rate.

This means that in the episode *Parachute Jump*⁶, when Mommy Pig jumps out of the aeroplane to save Daddy Pig, who fell out of the plane a few seconds earlier, this would not have worked in real life. If you want to see a great demonstration of a hammer and feather falling at the same rate when there is no air resistance, watch the clip of this experiment being done on the moon in 1971!⁷



4. You need to learn the quadratic formula for GCSE Maths. Why not find out what it is if you don't know?

5. You can watch the episode *Caves* here: <https://www.youtube.com/watch?v=2LA8TgmYsaE>

6. You can watch the episode *Parachute Jump* here: <https://www.youtube.com/watch?v=KMCxoyNjRYU&t>

7. <https://www.youtube.com/watch?v=Oo8TaPVsn9Y>