King Edward VI Camp Hill School for Girls

Maths Department Newsletter

4th January 2016

The numbers on opposite sides of a dice add up to 7

News

Happy New Year! As you may have noticed, it's now

2016!

by which we mean 2016, not 2016 factorial (which is written 2016! and means 2016 × 2015 × 2014 × … × 2 × 1)[1]. 2016 is an ACEPET number, which means it is an Abundant, Composite, Even, Practical, Evil, and Triangular number. Do you know what any of those things mean? Perhaps you could celebrate this ACEPET year by watching Ace Ventura Pet Detective, or you could find out when the next ACEPET year is by looking on a website like www.numbergossip.com.

Crossword Clue

The Times Cryptic Crossword on 7th December contained the following clue:

Next to a hypotenuse?

The answer has 9 letters. Can you work out what the word is?

Maths Quote

"In mathematics you don't understand things. You just get used to them." John von Neumann

If, however, you find that you're not even getting used to them, why not make it one of your new year's resolutions to come to Maths Workshop? (every Friday lunchtime in room 13)

Maths Word

An 'integer' is a whole number.

… -3, -2, -1, 0, 1, 2, 3…

The word was first used in the 16th century to mean 'whole'. It is related to the words 'entire', 'intact' and 'integrity'. The Latin root 'in' meaning 'not' and 'tangere' meaning 'to touch' gives the word the meaning 'untouched'. Integers are pure and undamaged numbers. So how many integers are there? Why not ask your maths teacher?

Maths Puzzle

How many pairs of positive integers can you multiply together to make 2016?

An Interesting Pattern

Maths is all about spotting patterns. Here is an interesting one from Ami in 7W.

$1 \times 8 + 1 = 9$
$12 \times 8 + 1 = 98$
$123 \times 8 + 1 = 987$
$1234 \times 8 + 1 = 9876$
$12345 \times 8 + 1 = 98765$
$123456 \times 8 + 1 = 987654$
$1234567 \times 8 + 1 = 9876543$
$12345678 \times 8 + 1 = 98765432$
$123456789 \times 8 + 1 = 987654321$

Joke

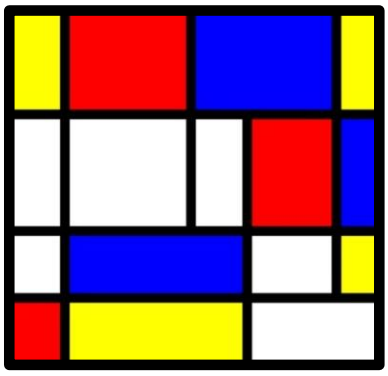
The improper fraction shop is now open 24/7

1. 2016 factorial is a ridiculously huge number. There are about 10^{80} atoms in the observable universe, and 2016 factorial makes that number look tiny by comparison.

Piet Mondrian

Piet Mondrian was a Dutch painter who lived from 1872 until 1944. He is best known for paintings that consist of a grid on a white background into which he would paint the three primary colours. He said, "The coloured planes, as much by position and dimension as by the greater value given to colour, plastically express only relationships and not forms." He also said that "intellect confuses intuition." We don't really know what that means, but we suspect it means that if you look at one of Mondrian's paintings and are tempted to think that anybody (perhaps even a five year old) could paint that, because it's just a random grid, randomly coloured in, then your intuition is actually being confused. It's actually a lot more complicated than it looks.[2]

Seriously though, the ideas involved in creating mathematical works of art illustrate the mathematical nature of art in general, and indeed anything that has a structure. However, if these ideas are a bit deep for the first week back after Christmas, then why not try this...

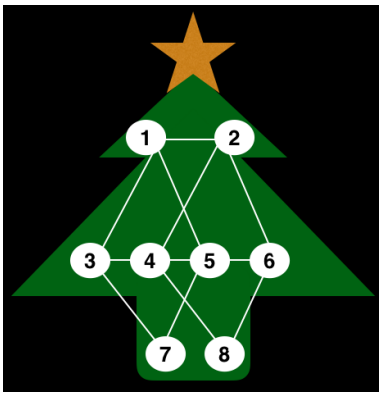


How many rectangles can you count in this painting by Piet Mondrian?

2. Probably.

Christmas Leftovers

If you are missing Christmas, here is a puzzle that didn't quite make it into the last newsletter.



Can you arrange the numbers in the tree so that no two adjacent numbers share an edge?

In other words, you can't put two numbers that are next to each other (e.g. 1 and 2) on the same line.

Did you know?

2016 is a leap year. We have these because the true length of a year is about 365.2422 days, but a calendar year is only 365 days. Adding an extra day every four years makes the average length of a calendar year 365.25 days, which is too big, so we miss a leap year every 100 years, making it 365.24 days, which is too small, so we add a leap year back in every 400 years making it 365.2425 days, which is very close to the true value. The plan is that every 4000 years we will take one leap year out again. This will make the average length of a calendar year 365.24225 days, which is almost perfect.

House Points

If you've worked out the solution to any of the puzzles in this newsletter, we will give you some house points if you let us know. If your solution contains some really impressive maths, then you may get a bigger prize, or end up being chosen to represent the school in one of the team competitions in which we take part.