## Week 33

What can you do with 666 ?
First, something simple:

$$
\begin{aligned}
666 & =1+2+3+\cdots+34+35+36 \\
& =1+2+3+4+567+89 \\
& =123+456+78+9 \\
& =9+87+6+543+21 \\
& =6+6+6+6^{3}+6^{3}+6^{3} \\
& =1^{6}-2^{6}+3^{6} \\
& =\sqrt{(6 \times 6 \times 6)^{2}+(666-6 \times 6)^{2}} \\
& =2^{2}+3^{2}+5^{2}+7^{2}+11^{2}+13^{2}+17^{2}
\end{aligned}
$$

where $2,3,5,7,11,13,17$ are the first seven prime numbers.
Now, observe that

$$
\begin{aligned}
& 666^{2}=443556 \\
& 666^{3}=295408296
\end{aligned}
$$

If you do some small tricks on the right-hand side, you obtain

$$
\left(4^{3}+4^{3}+3^{3}+5^{3}+5^{3}+6^{3}\right)+(2+9+5+4+0+8+2+9+6)=666
$$

Moreover, you may be amazed by comparing

$$
\begin{aligned}
& 666=2 \times 3 \times 3 \times 37 \\
& 6+6+6=2+3+3+3+7
\end{aligned}
$$

Finally, if you have good programming skills and feel that the above is not surprising enough, check out the following:

If you arrange a group of people in a solid 3010529326318802 -sided polygon with 666 people on each side, then you will have 666666666666666666666 people in total.

Of course, you can find some more fun stuff about $\mathbf{6 6 6}$ elsewhere.

