

3D shapes – types and properties

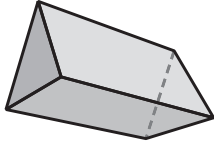
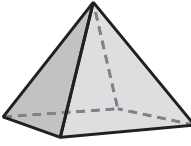
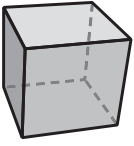
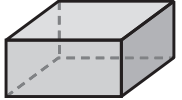
A Swiss mathematician called Leonhard Euler, found a mathematical rule that was so important, it was named after him. He wasn't just a pretty face ... He discovered a connection between the number of faces (F), number of edges (E) and number of vertices (V) of polyhedrons.



Here is part of Euler's rule: $F + V - E = \boxed{?}$

5 Your job is to try and work out what should go in the box. Because we are incredibly nice people we'll give you the following hints:

- The answer is a number.
- You should find the missing information in the table below. Use solids to help you.
- Then, for each shape, try $F + V - E$ and see what your answer is. It should always be the same. If not, you've gone wrong somewhere.

Polyhedron	Triangular prism	Square based pyramid	Cube	Rectangular prism
Number of faces (F)				
Number of vertices (V)				
Number of edges (E)				
Formula	 $F + V - E =$ ___ + ___ - ___ = ___	 $F + V - E =$ ___ + ___ - ___ = ___	 $F + V - E =$ ___ + ___ - ___ = ___	 $F + V - E =$ ___ + ___ - ___ = ___

What is Euler's formula? $F + V - E =$ _____

6 Find 2 more polyhedrons to test this out on:



It took Euler years to work this out and you've done it straight away. Well done! We suggest you take the rest of the day off. Just run it by your teacher, we're sure they'll be up for it.