**Algebraic Proof - Homework**

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| **Literacy**  You should know and understand the meaning of these words  Demonstrate  Prove  Integer | **Research – 5mins**  Bertrand Russell spent the first 360 pages of his book Principia Mathematica to prove a simple result. What was it? | **Memory and reminder**  All even numbers can be written in the form “2n” or “2m” etc, where n & m are integers.  All odd numbers can be written in the form “2n + 1” or “2p + 1” etc where n & p are integers.  Pythagoras’ Theorem says that for a right angled triangle, a2 + b2 = c2 |
| **Skills Practice – 20-40mins**  1a) Use examples to demonstrate that if a triangle has sides of length 3y, 4y and 5y it will be a right angled triangle.  1b) Use algebra to prove what you’ve just demonstrated.  2a) Use examples to demonstrate that the square of any even number is a multiple of 4.  2b) Use algebra to prove what you’ve just demonstrated.  3a) Use examples to demonstrate that the square of any odd number is one more than a multiple of 4.  3b) Use algebra to prove that for any odd number p, p2 = 4q + 1 where q is an integer. | | **Challenge** **and** **Stretch – 10-20mins**  1) All prime numbers from 5 onwards can be written in the form 6n ± 1 (that means either 6n + 1 or 6n – 1).  a) Can you demonstrate this?  b) Can you prove it?  Hint – think about why a number of the form 6n + 2 *wouldn’t* be prime….  2) Prove that if g and f are numbers in the sequence 3n + 1, gf will also be in that sequence. |