

MATHEMATICS ENRICHMENT CLUB.
Problem Sheet 8, June 24, 2019

1. Given that x and y are integers, how many different solutions are there to the equation

$$|x| + 2|y| = 100?$$

2. Place the numbers 1; 2; 4; 8; 16; 32; 64; 128 and 256 in a 3×3 square grid in such a way,

Senior Questions

1. How many different integers x satisfy the equation

$$(x^2 - 5x + 5)^{x^2 - 11x + 30} = 1?$$

2. The integers 5, 11, 17, 23 and 29 are five prime numbers in arithmetic progression. Find *six* prime numbers in arithmetic progression.
3. Given that n is a positive integer and $2n + 1$ and $3n + 1$ are perfect squares, prove that n is divisible by 40.