MAΘ Competition Team Problem Set 11

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Problem 1. Does the equation $49x + 28y = 14$ have integer solutions? What about $6x + 10y = 7$?

Problem 2. Solve $23x + 29y = 1$ for integers x and y. Express the solution in terms of k, where k is any integer.

Problem 3. Solve $3x + 5y = 16$ for integers x and y. Express the solution in terms of k, where k is any integer.

Problem 4. Find the smallest positive integer n such that the equation $455x + 1547y = 50000 + n$ has a solution (x,y), where x and y are integers.

Problem 5. Find a possible solution to $6x + 10y - 15z = 1$, where x, y, z are integers and $x < 0$.

Problem 6. If $\gcd(a, c) = \gcd(b, c) = 1$, show that $xa+yb = zc$ has infinitely many positive integer solutions.