Problem-1: Find all prime numbers p, q such that : $p^2 - pq - q^3 = 1$.   (Tuymada-2013)

Problem-2: Find all 3distinct prime numbers such that theirs sum is divisible by theirs products. (Tuymada-2014)

Problem-3: find all prime number p , such that $2p^2 - 3p - 1$ being cube.   (Thailand-2014)

Problem-4: find all primes p, q such that $q^2 - 1$ is divisible by p and $p^2 - 1$ is divisible by q. (Tuymada-61)

Problem-5: Find all natural number n such that $3n + 1$,$6n - 2$ being square and $6n^2 - 1$ being prime. (Tuymada-106)

Problem-6: find all integers m, n such that $\frac{1}{n^2} - \frac{3}{2n^3} = \frac{1}{m^2}$ Tuymada-245

Problem-7: find all positive integers a, b, c such that satisfy the six relations: (Russian Olympiads)

$$a|b^2 - 1, b|c^2 - 1, c|a^2 - 1, c|b^2 - 1, a|c^2 - 1, b|a^2 - 1$$

Problem-8: find all natural number m, n such that n is divisible by $m + 1$ and $n^2 - n + 1$ is divisible by m. (Bulgarian Olympiads-P:111)

Problem-9: Let $M(n) = \{n. n + 1, n + 2, n + 3, n + 4\}$ and denote $S(n)$ as sum of squares of elements of the set $M(n)$ and $P(n)$ as product of those squares find all natural number n such that $P(n)$ is divisible by $S(n)$. (Austrian Olympiads 2014)

Problem-10: find all positive integers (x, y) such that $x^2 + 8y, y^2 + 8x$ being square. (Ukraine-2013)

Problem-11: Prove that the equation $a^n + 2010b^n = c^{n+1}$ has infinitely many solutions in natural number. (Ukraine-2009-10)

Problem-12: natural number a, b are choosen in such a way that $m = a + b + 2\sqrt{ab + 1}$ is natural , prove that m is composite. (Ukraine-2009-10)

Problem-13: find integer solutions of the equation $x^2 + y^2 + z^2 - xy - yz - zx = x^3 + y^3 + z^3 + s$. If i.$s = 0$ or ii.$s = 1$ and iii.$s = -1$.   (Ukraine-2010-11)

Problem-14: find all primes p, q, r auch that $p(p + 1) + q(q + 1) = r(r + 1)$ (Ukraine-2010-11)

Problem-15: let a, b, c, d being natural numbers such that $ab + cd$ is divisible by $+bd$, prove that $ac + bd$ is a composite number. (Ukraine-2010-11)

Problem-16: let $d(n)$ be number of distinct divisors of natural number n prove that there exist infinitely many natural number n, such that $1 + d(n) + d(n + 1)$ is divisible by 3. (Ukraine-2010-11)

Problem-17: Five positive integers a, b, c, d, e chosen such that ab, bc, cd, de, ea are perfect cube , prove that a, b, c, d, e are so. (Ukraine-2008-09)

Problem-18: find all primes such that $2p^2 + p + 9$, being square. (Ukraine-2008-09)

Problem-19: find all primes p, q and integer a such that $\frac{pq}{p+q} = \frac{a^2+1}{a+1}$ (62CZ)

Problem-20: find all primes p, such that $\frac{p^2+1}{p+1} = \frac{n^2}{m^2}$ (Swiss-2013)

Problem-21: find all pairs of integers a, b such that $\frac{a^2+1}{2b^2-3} = \frac{a-1}{2b-1}$. (62CZ)

Problem-22: find all integers x, y, z, such that $x^4 + x^2 = 7^z y^2$ (Austria-2011)

Problem-23: find all pairs of positive integers a, b such that$a^b + b$ divides $a^{2b} + 2b$. (Austria-2011)

Problem-24: find all integers $x > y > z > 0$, such that$x^2 = y2^z + 1$ Austria-2010)

Problem-25: let $a_1, a_2, \dots, a_{11}$ be different positive integers , which is greater than or equal to 2 and theirs sum is 407. Does there exist an integer n such that the sum of its reminders by the numbers $a_1, a_2, \dots, a_{11}, 4a_1, 4a_2, \dots, 4a_{11}$ being equal to 2012? (Russian Olympiads-2012)