Indeterminate Equation

Pell's Equation



Learn how to solve this *type* of problems, not just this problem.

- 1. Solve in integers the equation $x^2 + y^2 1 = 4xy$. (Ref Ref 2300)
- 2. Show that if x and y are positive integer solutions to the equation $x^2 2y^2 = 1$, then $6 \mid xy$. (Ref 2093)
- 3. Find all right triangles whose two sides are consecutive integers, and hypotenuse are also integers.

 (Ref Ref 2347)
- 4. Find all triangles whose sides are consecutive integers and areas are also integers. (Ref Ref 2096)
- 5. Find all positive integers k, m such that k < m and

$$1+2+\cdots+k = (k+1)+(k+2)+\cdots+m$$

(Ref Ref 2098)

6. Find all positive integer n such that

$$C_n^{k-1} = 2C_n^k + C_n^{k+1}$$

for some positive integer k < n. (Ref Ref 2306)

- 7. Prove that if the difference of two consecutive cubes is n^2 where n is a positive integer, then 2n-1 is a square.

 (Ref Ref 2308)
- 8. Let r be a positive real number, and [r] be the largest integer that not exceeding x. Prove that there exist infinity number of positive integers, n, such that $[\sqrt{2} \ n]$ is a perfect square.

 (Ref Ref 2302)
- 9. Solve in rational numbers the equation $x^2 dy^2 = 1$ where d is an integer. (Ref Ref 2301)
- 10. Let p be a prime. Prove that the equation $x^2 py^2 = -1$ has integral solution if and only if p = 2 or $p \equiv 1 \pmod{4}$.

 (Ref Ref 2310)