

Indeterminate Equation



Learn to solve this type of problems, not just this problem!

- (1) Find all the ordered integer pairs (x, y) that satisfy $x + xy + y = 8$.
- (2) Solve in integers the equation $41x + 37y = 13$.
- (3) Solve in positive integers the following equations:
 - (i) $\frac{1}{x} + \frac{1}{y} = \frac{1}{6}$.
 - (ii) $\frac{1}{x} + \frac{1}{y} = \frac{3}{5}$.
 - (iii) $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{4}{5}$.
- (4) Solve the equation $x^2 + y^2 = 6x - 4y - 13$.
- (5) How many ordered integer pairs (x, y) can satisfy $5(x^2 + 3) = y^2$?
- (6) Find all the right triangles that satisfy the following two conditions:
 - the lengths of all its three sides are integers, and
 - its area and perimeter are numerically equal
- (7) Solve in positive integers $y^2 = x^2 + x + 1$.
- (8) Find all pairs of positive integers (x, y) where x and y are relatively prime, such that the following expression is an integer:

$$\frac{x}{y} + \frac{15y}{4x}$$
- (9) Solve in integers the equation: $x^2 + y^2 = 2015$.
- (10) Find all positive integer triplets (x, y, z) such that $3^x + 4^y = 5^z$.
- (11) Solve in integers the equation $x^3 + 2y^3 = 4z^3$.
- (12) Find all the triangles whose sides are three consecutive integers and areas are also integers