Bank Soal Olimpiade Matematika SMA (II)

Spring Camp Persiapan OSN 2018

Departemen Matematika - Wardaya College

1. Find all integer solutions to the equation
   $x^3 - y^3 = 2xy + 8$

2. Given that the system of equation
   $\begin{cases} x^2 + y^2 = a^2 + 2 \\ \frac{1}{x} + \frac{1}{y} = a \end{cases}$
   Find the range of a such that the system has exactly two solutions

3. Given that x, y, z are real numbers which are not equall satisfying
   $x + \frac{1}{y} = y + \frac{1}{z} = z + \frac{1}{x} = k$
   where k is real numbers. Find all possible value of k

4. For which positive integer a and b with $b > 2$ does the number $2^b - 1$ divides $2^a + 1$?

5. Is it possible to represent to represent 1 in the form

   - $\frac{1}{a_1} + \frac{1}{a_2} + \cdots + \frac{1}{a_6}$
   - $\frac{1}{a_1} + \frac{1}{a_2} + \cdots + \frac{1}{a_9}$

   where a_i's are distinct odd positive numbers?
   Generalize the problem!