1. Suppose that \(a, b,\) and \(c\) are positive integers such that not all of them are even, \(a < b, a^2 + b^2 = c^2,\) and \(c - b = 289.\) What is the smallest possible value for \(c?\)

Answer:

2. If \(a,b > 1\) and \(a^2\) is 11 in base \(b,\) what is the third digit from the right of \(b^2\) in base \(a?\)

Answer:

3. Find real numbers \(a, b\) such that \(x^2 - x - 1\) is a factor of \(ax^{10} + bx^9 + 1.\)

Answer: