

Problem 2

Let x_1, x_2, x_3, \dots be a sequence of nonzero real numbers satisfying

$$x_n = \frac{x_n - 2x_{n-1}}{2x_{n-2} - x_{n-1}}, \quad n = 3, 4, 5, \dots$$

Establish necessary and sufficient conditions on x_1 and x_2 for x_n to be an integer for infinitely many values of n .