

Consider a polynomial

$$f(x) = x^{2012} + a_{2011}x^{2011} + \cdots + a_1x + a_0.$$

Albert Einstein and Homer Simpson are playing the following game. In turn, they choose one of the coefficients  $a_0, \dots, a_{2011}$  and assign a real value to it. Albert has the first move. Once a value is assigned to a coefficient, it cannot be changed any more. The game ends after all the coefficients have been assigned values.

Homer's goal is to make  $f(x)$  divisible by a fixed polynomial  $m(x)$  and Albert's goal is to prevent this.

- a) Which of the players has a winning strategy if  $m(x) = x - 2012$ ?
- b) Which of the players has a winning strategy if  $m(x) = x^2 + 1$ ?