

Preparation Activity PA01 – Proof by Induction

During the development of a software application, the software team started to note that the size of one of the data structures increases according to the value of a positive integer variable n in the following way.

$$1 + x + x^2 + \dots + x^n = \frac{x^{n+1} - 1}{x - 1}$$

They need now to prove the validity of this proposition as they intend that the software application provides certain decisions based on the value of n and x .

Prove by using the induction method the previous proposition considering $n \geq 0$.