

Let r be any real number and let n be a non-negative integer. The sum

$$1 + r + r^2 + \cdots + r^n \tag{1}$$

is a *geometric sum* and the infinite series

$$1 + r + r^2 + \cdots + r^n + \cdots \tag{2}$$

is a *geometric series*.

Suppose that $r \neq 1$. Then the geometric sum (1) can be computed by the formula

$$1 + r + r^2 + \cdots + r^n = \frac{1 - r^{n+1}}{1 - r}.$$

Give a carefully written and readable proof of the formula using mathematical induction.

Please hand in your finished, type-written solution at the beginning of class next week 9/17/03.