$$\lim_{x \to 1}(1 + x + x^2 + \cdots + x^{m-1})$$

Solution

It is known that $\lim\limits_{x \to 1} x^n = 1$, where n is integer.

Then

$$\lim_{x \to 1}(1 + x + x^2 + \cdots + x^{m-1}) = \lim_{x \to 1}(x^0 + x^1 + x^2 + \cdots + x^{m-1}) = \underbrace{1 + 1 + 1 + \cdots + 1}_{m} = 1 \cdot m = m.$$

Answer: m.