Formula for sum of geometric progression

Basic fact:

$$a + ar + ar^2 + ar^3 + \cdots ar^n = \frac{a(r^{n+1} - 1)}{r - 1}$$

Example:

$$2 + 2\times 5 + 2\times 5^2 + 2\times 5^3 + \cdots + 2\times 5^n = \frac{2\times(5^{n+1} - 1)}{4}$$

$$= \frac{1}{2}(5^{n+1} - 1)$$