

J. For a real number x we denote by $[x]$ the largest integer less than or equal to x .

Let n be a natural number. The integral

$$\int_0^n [2^x] dx$$

equals

(a) $\log_2((2^n - 1)!)$; (b) $n2^n - \log_2((2^n)!)$; (c) $n2^n$; (d) $\log_2((2^n)!)$,

where $k! = 1 \times 2 \times 3 \times \cdots \times k$ for a positive integer k .