



## Question

Which of the following calculations of the term-by-term derivatives of the power series  $\sum_{n=1}^{\infty} n^2 x^n$  is valid?

A.  $\frac{d}{dx} \left( \sum_{n=1}^{\infty} n^2 x^n \right) = \sum_{n=1}^{\infty} 2n x^n$

B.  $\frac{d}{dx} \left( \sum_{n=1}^{\infty} n^2 x^n \right) = \sum_{n=1}^{\infty} n^3 x^{n-1}$

C.  $\frac{d}{dx} \left( \sum_{n=1}^{\infty} n^2 x^n \right) = \sum_{n=1}^{\infty} (2n x^n + n^2 (n x^{n-1}))$

D.  $\frac{d}{dx} \left( \sum_{n=1}^{\infty} n^2 x^n \right) = \sum_{n=1}^{\infty} (2n)(n x^{n-1})$