PRINT Your Name:_____

Remove everything from your desk except this page and a pencil or pen.
The solution will be posted soon after the quiz is given.

Circle your answer. **Show your work. Your work must be correct and coherent.**

The quiz is worth 5 points.

Find the sum of $\sum\limits_{n=2}^{\infty} n(n-1)x^n$ for $|x| < 1$.

Answer. We know that $\sum\limits_{n=0}^{\infty} x^n = \frac{1}{1-x}$ for $|x| < 1$. Take the derivative to get

$\sum\limits_{n=0}^{\infty} nx^{n-1} = \frac{1}{(1-x)^2}$ for $|x| < 1$. Take another derivative to get: $\sum\limits_{n=0}^{\infty} n(n-1)x^{n-2} =$

$\frac{2}{(1-x)^3}$ for $|x| < 1$. Multiply by x^2 to get: $\sum\limits_{n=0}^{\infty} n(n-1)x^n = \frac{2x^2}{(1-x)^3}$ for $|x| < 1$. Of

course, when $n = 0$ or $n = 1$, then $n(n-1)x^n$ is zero; so $\sum\limits_{n=2}^{\infty} n(n-1)x^n = \frac{2x^2}{(1-x)^3}$

for $|x| < 1$.