

PRINT Your Name: _____

Quiz – November 16, 2004

Find a power series which is equal to $f(x) = xe^{x^2}$.

Answer: We know that

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}.$$

It follows that

$$e^{x^2} = \sum_{n=0}^{\infty} \frac{(x^2)^n}{n!} = \sum_{n=0}^{\infty} \frac{x^{2n}}{n!}$$

and

$$xe^{x^2} = \sum_{n=0}^{\infty} \frac{x^{2n+1}}{n!} = x + x^3 + \frac{x^5}{2} + \frac{x^7}{3!} + \frac{x^9}{4!} + \frac{x^{11}}{5!} + \dots$$