

Find the interval of convergence for the following power series:

1. $\sum_{j=0}^{\infty} \frac{x^j}{j!}$

2. $\sum_{n=0}^{\infty} (n+1)(x-3)^n$

Find power series expansions about $x_0 = 0$ for the following:

1. $f(x) = \sin(x)$

2. $f(x) = \cos(x)$

Hint: $\frac{d}{dx} \sin(x) = \cos(x)$

3. $\cos(x^2)$

Feel free to use the result from (b).

4. $\int \cos(x^2) dx$

Then approximate $\int_0^1 \cos(x^2) dx$ accurate within 10^{-5} .