

Find the interval of convergence for each series.

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

2.
$$\sum_{k=1}^{\infty} \frac{(x+2)^k}{k^2 3^k}$$

3.
$$\sum_{n=0}^{\infty} \frac{2^n x^n}{n!}$$