

## Series

## Power Series

1. 
$$\sum_{n=0}^{\infty} x^n$$

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

3. 
$$\sum_{n=1}^{\infty} \frac{x^n}{n}$$

4. 
$$\sum_{n=0}^{\infty} n!(2x+1)^n$$

5. 
$$\sum_{n=0}^{\infty} (x-8)^n$$

6. 
$$\sum_{n=0}^{\infty} (-3)^n n(x+1)^n$$

7. 
$$\sum_{n=1}^{\infty} x^n$$

8. 
$$\sum_{n=1}^{\infty} \frac{x^n}{4n-1}$$

9. 
$$\sum_{n=0}^{\infty} (-1)^n x^n$$

10. 
$$\sum_{n=0}^{\infty} \frac{x^n}{2^{n+1}}$$

## Answers

### Series

#### Power Series

1. Radius of convergence is 1, Interval of convergence is  $-1 < x < 1$
2. Radius of convergence is  $\infty$ , Interval of convergence is  $-\infty < x < \infty$
3. Radius of convergence is 1, Interval of convergence is  $-1 \leq x < 1$
4. Radius of convergence is 0, Interval of convergence is  $x = -\frac{1}{2}$
5. Radius of convergence is 1, Interval of convergence is  $7 < x < 9$
6. Radius of convergence is  $\frac{1}{3}$
7. Radius of convergence is 1, Interval of convergence is  $-1 < x < 1$
8. Radius of convergence is 1, Interval of convergence is  $-1 \leq x < 1$
9. Radius of convergence is 1, Interval of convergence is  $-1 < x < 1$
10. Radius of convergence is 2