9.5 Power Series and Interval of Convergence

Name: Date:

P 12. Find the radius of convergence for

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

P 16. Find the radius of convergence for

$$\sum_{n=1}^{\infty}\frac{2^n(x-1)^n}{n}$$

P 20. Find the radius of convergence for

$$1 + 2x + \frac{4!x^2}{(2!)^2} + \frac{6!x^3}{(3!)^2} + \frac{8!x^4}{(4!)^2} + \frac{10!x^5}{(5!)^2} + \cdots$$

P 27. Find the interval of convergence of

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

P 28. Find the interval of convergence of

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

P 29. Find the interval of convergence of

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

P 30. Find the interval of convergence of

$$\sum_{n=1}^{\infty} \frac{(-1)^n (x-5)^n}{2^n n^2}.$$

P 31. Find the interval of convergence of

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

P 32. Find the interval of convergence of

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

P 33. Find the interval of convergence of

$$\sum_{n=1}^{\infty} \frac{(5x)^n}{\sqrt{n}}.$$

P 34. Find the interval of convergence of

$$\sum_{n=1}^{\infty} \frac{(5x)^{2n}}{\sqrt{n}}.$$

P 35. Find a power series centered at the origin that converges to

$$\frac{1}{1+2z}.$$

For what values does the series converge?

P 36. Find a power series centered at the origin that converges to

$$\frac{2}{1+y^2}.$$

For what values does the series converge?

P 37. Find a power series centered at the origin that converges to

$$\frac{3}{1 - z/2}.$$

For what values does the series converge?

P 38. Find a power series centered at the origin that converges to

$$\frac{8}{4+y}.$$

For what values does the series converge?

P 41. The series $\sum C_n x^n$ converges at $x = -5$ and diverges at $x = 7$. What can you say about its radius of convergence?

P 42. The series $\sum C_n(x+7)^n$ converges at $x = 0$ and diverges at $x = -17$. What can you say about its radius of convergence?

P 43. The series $\sum C_n x^n$ converges at $x = -4$ and diverges at $x = 7$. Decide whether each of the following statements is true or false, or whether this cannot be determined.

(a) The power series converges when $x = 10$.

(b) The power series converges when $x = 3$.

(c) The power series diverges when $x = 1$.

(d) The power series diverges when $x = 6$

P 44. If $\sum C_n(x-3)^n$ converges at $x = 7$ and diverges at $x = 10$, what can you say about the convergence at $x = 11$? At $x = 5$? At $x = 0$?