

Power Series

Find the radius and interval of convergence for each of the following series.

1.
$$\sum_{n=1}^{\infty} \frac{(4x-1)^n}{(2n)^n}$$

2.
$$\sum_{n=5}^{\infty} (n-3)!(x+8)^n$$

3.
$$\sum_{n=0}^{\infty} \frac{(2x+6)^n}{(-3)^{n-1}}$$

4.
$$\sum_{n=0}^{\infty} \frac{(x-1)^n}{2^{3n+1}(n+1)}$$

Power Series and Functions

Find a power series representation for each of the following.

5.
$$g(t) = \frac{4t}{7-\sqrt{t}}$$

6.
$$f(x) = \frac{x^2}{1+3x^4}$$

Taylor Series

7. Use a Taylor series derived in class to find a Taylor series for $f(x) = x^2 \cos(4\sqrt{x})$ about $x = 0$.

For problems 8 – 10 find a Taylor series for the given function about the given point.

8. $g(x) = 3x^2 + 18x - 4$ about $x = -7$.

9. $f(x) = \ln(7-5x)$ about $x = 0$.

10. $h(x) = \frac{4}{(1+2x)^5}$ about $x = -4$.