Power Series

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

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

2. $\displaystyle\sum_{n=0}^{\infty} (2n)!(x+5)^n$

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

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

Power Series and Functions

Find a power series representation for each of the following.

5. $h(x) = \dfrac{6x^7}{1+4\sqrt{x}}$

6. $f(t) = \dfrac{2t}{3-5t^2}$

Taylor Series

7. Use a Taylor series derived in class to find a Taylor series for $f(x) = x^2 \sin(8x^3)$ about $x = 0$.

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

8. $g(x) = 8 - 6x - 4x^2$ about $x = 7$.

9. $h(x) = \sqrt{1-x}$ about $x = -3$.

10. $f(x) = \ln(7+2x)$ about $x = 0$.