

BC Classwork 8.7-8.10

For the following series, find the radius and the interval of convergence.

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

2. $\sum_{n=1}^{\infty} (3n)!(5x+21)^n$

3. $\sum_{n=0}^{\infty} \frac{(8x-24)^n}{4^{1+2n}(3n)}$

Find a power series representation for each of the following:

4. $f(x) = \frac{x^2}{9-\sqrt{x}}$

5. $f(x) = \frac{6x}{4+3x^7}$

6. Use the Taylor series for $\cos(x)$ to derive the Taylor series for $f(x) = x^2 \cos(3x^2)$ about $x = 0$.

7. Find a Taylor series for the given function at the given point.

$f(x) = 2 + 3x + 4x^2$ about $x = -5$.

For problems 8 & 9 write out the first three nonzero terms of the Taylor series for the given function about the given point. Your answer should be in the following form with a plugged in (you may need more terms to get 3 that are not zero...),

$$f(x) = f(a) + \frac{f'(a)}{1!}(x-a) + \frac{f''(a)}{2!}(x-a)^2 + \frac{f'''(a)}{3!}(x-a)^3 + \dots$$

8. $f(x) = \sin(6+2x) + \sin(\pi x)$ about $x = -3$

9. $f(x) = e^{-x^2} \cos(4x)$ about $x = 0$ (Use only the common series that you have memorized)