

Name: _____

MA 2320 Quiz 8

1. For the following Power series compute the radius of convergence.

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

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

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

(d) $\sum_{n=1}^{\infty} \frac{1}{n!} x^n$

2. Compute the Taylor series for the following using the formula directly.

(a) $f(x) = \frac{1}{1-x}$ at $x_0 = 0$

(b) $f(x) = \cos(x)$ at $x_0 = 0$

(c) $f(x) = \sin(x)$ at $x_0 = 0$

(d) $f(x) = e^x$ at $x_0 = 0$

(e) $f(x) = x^3$ at $x_0 = 4$

(f) $f(x) = \cos(2x)$ at $x_0 = \pi$

(g) $f(x) = \ln(1+x)$ at $x_0 = 0$

3. Recall previous Taylor Series to aid in computing the following.

(a) $f(x) = \sin(2x)$ at $x_0 = 0$. Use the series for $f(x) = \sin(x)$.

(b) $f(x) = \ln(1+x^2)$ at $x_0 = 0$. Use the series for $f(x) = \frac{1}{1-x}$

(c) $f(x) = \cos(x) + i \sin(x)$ where i satisfies the equation $i^2 = -1$.

(d) $f(x) = e^{ix}$ where i satisfies the equation $i^2 = -1$.