

Math 142V Practice for Test 2

You must show all of your work and reasoning to receive full credit.

[10] 1. Determine whether the series is convergent or divergent. If it is convergent, find its sum.

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

[15] 2. Determine whether the series is convergent or divergent.

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

[15] **3.** Determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \frac{\sin\left(\frac{n\pi}{10}\right)}{10^n}$$

[15] 4. Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\sqrt[5]{n}}$$

[15] **5.** Determine the radius and interval of convergence of the power series.

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

[15] **6.** Find a power series representation for the function and determine its radius of convergence.

$$f(x) = \frac{x^2}{x^2 + 1}$$

[15] 7. Find the Taylor series for f centered at the given value of a , and find the associated radius of convergence.

$$f(x) = \ln(2x), \quad a = 2$$