

Name _____

Use the test of your choice to determine whether the series converges. State the test used. Show work.

1) $\sum_{n=1}^{\infty} \frac{\cos 1/n}{n^2}$ 1) _____

2) $\sum_{n=1}^{\infty} \frac{1}{(\ln 4)^n}$ 2) _____

3) $\sum_{n=1}^{\infty} \frac{3n}{n^2 + 5}$ 3) _____

4) $\sum_{n=1}^{\infty} \frac{(n!)^n}{(n^n)^{10}}$ 4) _____

5) $\sum_{n=1}^{\infty} \left(\frac{\ln n}{9n - 2} \right)^n$ 5) _____

6) $\sum_{n=1}^{\infty} \frac{\sin n \cos n}{4^n}$ 6) _____

7) $\sum_{n=1}^{\infty} n! e^{-6n}$ 7) _____

8) $\sum_{n=1}^{\infty} \frac{4n + 1}{\sqrt{3n^4 + 3n + 6}}$ 8) _____

9) $\sum_{n=1}^{\infty} \sin \left(\frac{4n^2 + 4}{n^4 + 4} \right)$ 9) _____

10) $\sum_{n=1}^{\infty} \frac{2n^{1/4}}{3n^{5/4} + 5}$ 10) _____

11) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n + \sqrt{n}}{n^2 + 1}$ 11) _____

Determine if the series converges absolutely, converges, or diverges.

12) $\sum_{n=1}^{\infty} \frac{(-2)^n}{7n^6 + 2^n}$ 12) _____

13) $\sum_{n=1}^{\infty} (-1)^n \left(\frac{1}{3} - \frac{2}{n} \right)^n$ 13) _____

14) $\sum_{n=1}^{\infty} (-1)^n (\sqrt{n^2 + 1} - n)$ 14) _____

Find the interval of convergence of the series.

15) $\sum_{n=0}^{\infty} \frac{(x - 8)^n}{3n + 9}$ 15) _____

16) $\sum_{n=1}^{\infty} \frac{(x - 9)^n}{(5n)!}$ 16) _____

Find the function represented by the power series.

17) $\sum_{n=0}^{\infty} \left(\frac{x^2 + 6}{2} \right)^n$ 17) _____

Find the Taylor series generated by f at x = a.

18) $f(x) = \frac{1}{x}, a = 6$ 18) _____

Find the first four nonzero terms in the Maclaurin series for the function.

19) $f(x) = e^{2x}$ 19) _____

20) $f(x) = x \sin(3x)$ 20) _____