

CH.9 9.1-9.6 Review WS #1 Name: _____**Tell whether each series converges or diverges****Geometric Series Test**

1) $\sum_{n=1}^{\infty} 10\left(-\frac{4}{9}\right)^n$

2) $\sum_{n=1}^{\infty} 11\left(\frac{8}{3}\right)^n$

3) $\sum_{n=1}^{\infty} \left(\frac{2}{7}\right)^n \cdot 4^n$

4) $\sum_{n=1}^{\infty} (1)^n$

5) $\sum_{n=1}^{\infty} \left(\frac{\sin 3}{e}\right)^n$

6) $\sum_{n=1}^{\infty} \left(\frac{2}{5}\right)^n \cdot \left(\frac{3}{2}\right)^n$

nth term test

7) $\sum_{n=2}^{\infty} \frac{5n+3}{7n-2}$

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

9) $\sum_{n=2}^{\infty} \frac{8n^3+1}{3n}$

Telescoping Series Test

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

11) $\sum_{n=1}^{\infty} \frac{11}{n} - \frac{11}{n+3}$

12) $\sum_{n=3}^{\infty} \frac{3}{n-2} - \frac{3}{n}$

p - series test

13) $\sum_{n=1}^{\infty} \frac{1}{n^3}$

14) $\sum_{n=5}^{\infty} \frac{1}{\sqrt{n}}$

15) $\sum_{n=1}^{\infty} \frac{100}{\sqrt[3]{n^2}}$

16) $\sum_{n=1}^{\infty} \frac{5}{n^{3/2}}$

17) $\sum_{n=5}^{\infty} \frac{7}{\sqrt[3]{n^5}}$

18) $\sum_{n=1}^{\infty} \frac{1}{n}$

Integral Test

19) $\sum_{n=0}^{\infty} \frac{1}{n^2+1}$

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

21) $\sum_{n=1}^{\infty} e^{-n}$

Limit Comparison Test

22)
$$\sum_{n=0}^{\infty} \frac{2}{n^2 + 1}$$

23)
$$\sum_{n=0}^{\infty} \frac{1}{n-1}$$

24)
$$\sum_{n=2}^{\infty} \frac{4n}{n^2 - 5}$$

25)
$$\sum_{n=0}^{\infty} \frac{n^2}{n^7 + 1}$$

26)
$$\sum_{n=0}^{\infty} \frac{1}{n\sqrt{n^2 + 1}}$$

27)
$$\sum_{n=2}^{\infty} \frac{6n}{\sqrt[3]{n^{12} - 1}}$$

Direct Comparison Test

28)
$$\sum_{n=0}^{\infty} \frac{1}{n^2 + 1}$$

29)
$$\sum_{n=0}^{\infty} \frac{1}{n-1}$$

30)
$$\sum_{n=2}^{\infty} \frac{6^n}{7^n + 5}$$

Ratio Test

31)
$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{3^n}{n^5}$$

32)
$$\sum_{n=0}^{\infty} \frac{400^n}{(n+2)!}$$

33)
$$\sum_{n=1}^{\infty} (-1)^n \frac{n!}{2^n}$$

34)
$$\sum_{n=0}^{\infty} \frac{e^n}{(n+1)!}$$

35)
$$\sum_{n=0}^{\infty} \frac{n^{10}}{2^n}$$

36)
$$\sum_{n=1}^{\infty} (-1)^n \frac{n!}{n^{100}}$$

Root Test

37)
$$\sum_{n=1}^{\infty} (-1)^n \frac{7^n}{3^n n^n}$$

38)
$$\sum_{n=0}^{\infty} \frac{n^n}{8^n}$$

39)
$$\sum_{n=1}^{\infty} (-1)^n \left(\frac{5}{2}\right)^n$$

Tell whether each series is absolutely convergent, conditionally convergent, or divergent #40 - 45.

$$40) \sum_{n=0}^{\infty} (-1)^n \frac{1}{n-70}$$

$$41) \sum_{n=2}^{\infty} (-1)^{n+1} \frac{n+1}{n^3-6}$$

$$42) \sum_{n=1}^{\infty} (-1)^n \frac{3}{\sqrt[3]{n^2+1}}$$

$$43) \sum_{n=0}^{\infty} (-1)^n \frac{n^5}{\sqrt{n^{10}+3}}$$

$$44) \sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2-1}{n^5+17}$$

$$45) \sum_{n=2}^{\infty} (-1)^n \frac{50n^4+3}{\sqrt[3]{n^9-24}}$$

Find each sum if possible #46 – 51

$$46) \sum_{n=4}^{\infty} \frac{100}{n} - \frac{100}{n+1} =$$

$$47) \sum_{n=1}^{\infty} 50 \left(\frac{3}{5} \right)^n =$$

$$48) \sum_{n=0}^{\infty} 20 \left(\frac{8}{3} \right)^n =$$

$$49) \sum_{n=2}^{\infty} \frac{12}{n-1} - \frac{12}{n+1} =$$

$$50) \sum_{n=0}^{\infty} 700 \left(\frac{3}{10} \right)^n =$$

$$51) \sum_{n=2}^{\infty} \frac{8}{n-1} - \frac{6}{n+2} =$$

52) Ball A is dropped from a height of 120 ft. and bounces $\frac{2}{3}$ of its height on each bounce. Ball B is shot into the air to a height of 70 ft. and bounces $\frac{7}{10}$ of its height on each bounce. Which ball travels the furthest and by how much?