

Name: \_\_\_\_\_

AP Calculus – Series Practice

Section 9.2 – 9.3

Determine if the following series converge or diverge. Justify your answer.

1.  $\sum_{n=1}^{\infty} \frac{4n+1}{3n-1}$

2.  $\sum_{n=0}^{\infty} \frac{3}{5^n}$

3.  $\sum_{n=2}^{\infty} \frac{\ln n}{n^3}$

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

5.  $\sum_{n=1}^{\infty} e^{-n}$

6.  $\sum_{n=1}^{\infty} \frac{1}{9n^2+3n-2}$

7.  $1 + \frac{1}{\sqrt[3]{4}} + \frac{1}{\sqrt[3]{9}} + \frac{1}{\sqrt[3]{16}} + \frac{1}{\sqrt[3]{25}} + \dots$

8.  $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$

9.  $\sum_{n=0}^{\infty} [(0.3)^n + (0.8)^n]$

10.  $\sum_{n=1}^{\infty} \frac{3}{n^3}$

For the following series, find the exact sum (if possible). If the exact sum isn't possible, estimate the sum using the 4<sup>th</sup> partial sum. If the series diverges, justify why it diverges.

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

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

13.  $\sum_{n=1}^{\infty} ne^{-n^2}$

14.  $9 - 3 + 1 - \frac{1}{3} + \dots$

15.  $\sum_{n=1}^{\infty} \frac{\arctan x}{n^2+1}$

16.  $\sum_{n=1}^{\infty} \frac{1}{9n^2+3n-2}$

17.  $\sum_{n=1}^{\infty} ne^{-\frac{n}{2}}$

