Chapter 9 AP Calculus BC quiz review

(the sequences in 1-3 will start with n=1)

1) a) Write the first 4 terms of the sequence $a_n = \frac{n+1}{2^n}$

b) Does the sequence converge? If so, to what? If not, why?

2) a) Write the first 4 terms of the of the sequence $a_n = \frac{4n-1}{2n+1}$

b) Does the sequence converge? If so, to what? If not, why?

3) a) Write the first 4 terms of the of the sequence $a_n = \frac{(-1)^n n!}{2^n}$

b) Does the sequence converge? If so, to what? If not, why?

For 4 - 8: Does the series converge? If so, to what? If not, why?

4) $\sum_{n=1}^{\infty} 3(.4)^n$

5) $\sum_{n=0}^{\infty} \frac{4}{(-3)^n}$

6) $\sum_{n=1}^{\infty} 2(\frac{10}{9})^n$

7) $12 + 2 + \frac{1}{3} + \frac{1}{18} + \cdots$

8) $100 - 20 + 4 - \frac{4}{5} + \cdots$

9) For what values of x does $\sum_{n=0}^{\infty} 3(x-2)^n$ converge?

For 10 - 21: Does the series converge or diverge. Support your answer. State the conditions that must be a satisfied before applying any test.

10) $\sum_{n=1}^{\infty} \frac{4}{n^2}$

11) $\sum_{n=1}^{\infty} \frac{3}{2n-1}$

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

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

14) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{3n}{4n^2+1}$

15) $\sum_{n=1}^{\infty} \frac{5n}{n-1}$

16) $\sum_{n=1}^{\infty} \frac{3^n}{(n+1)!}$

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

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

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

20) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{3n}{10n+1}$

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

22) Does the series $\sum_{n=1}^{\infty}(-1)^n \frac{2}{4^n}$ converge conditionally or absolutely? Support your answer.

23) a) Does the series $\sum_{n=1}^{\infty}(-1)^{n+1} \frac{3n}{n^2+1}$ converge conditionally or absolutely? Support your answer.

b) Find the sum of the first 10 terms.

c) What is the error in approximating S_∞ using the first 10 terms.

d) Using this error write an inequality that shows that possible range of S_∞.

24) A particle moves along the x-axis and its velocity at time t is found by v(t) = 4cos(2t) (t≥0) If the position of the particle at time t = $\frac{\pi}{12}$ is 5, what is its position at t=0?

25) Consider the continuous function f(x) with some values of f(x) shown in the chart.

x	5	7	10	11	15
f(x)	6	3	4	5	7

a) Approximate $\int_5^{15} f(x)dx$ using a right Riemann sum and 4 sub-intervals.

b) Approximate $\int_5^{15} f(x)dx$ using a trapezoid sum and 4 sub-intervals.

c) Approximate f '(13)