BC Calculus Name_____Pd.____Seat #_____

Review #1 Infinite Series Day 9

Determine whether each of the series converges or diverges. Identify which test you used.

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

2. $\sum_{n=0}^{\infty} \frac{1}{2^n}$

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

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

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

6. $\sum_{n=1}^{\infty} \frac{\cos \pi n}{n}$

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

8. $\sum_{n=1}^{\infty} \frac{n}{\ln(n)}$

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

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

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

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

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

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

15. $\sum_{n=0}^{\infty} \left(\sqrt{3}\right)^n$

16. $\sum_{n=0}^{\infty} \frac{n^2 - n - 5}{n^4 + 2n^3 - 3n + 1}$

17. $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^3}$

18. $\sum_{n=1}^{\infty} n e^{-n^2}$

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

20. $\sum_{n=1}^{\infty} \frac{7}{\sqrt[4]{n^5}}$

BC Calculus Name_____Pd.____Seat #_____
Review #1 Infinite Series Day 9

Determine whether each the following series converges conditionally, converges absolutely, or diverges:

21. $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$

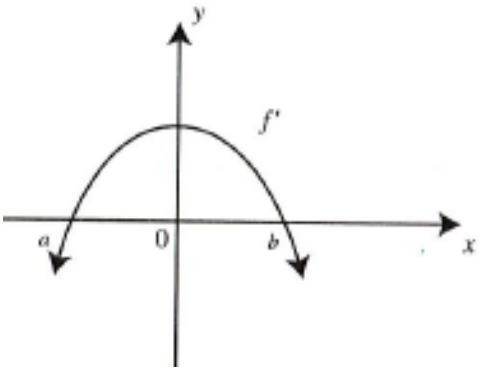
22. $\sum_{n=2}^{\infty} \frac{(-1)^n \ln n}{n}$

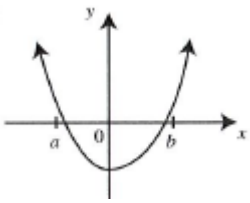
23. $\sum_{n=2}^{\infty} \frac{(-1)^n n}{(\ln n)^2}$

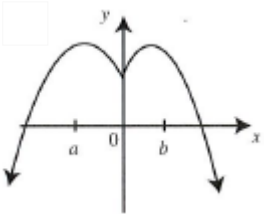
24. $\sum_{n=1}^{\infty} \frac{(-1)^n 2^n}{e^n - 1}$

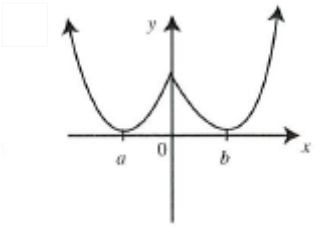
Review:

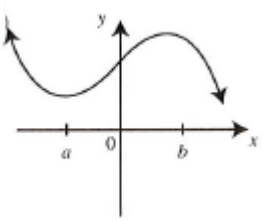
R1. The graph of f' is shown in the figure to the right. Which of the following is a possible graph of f?

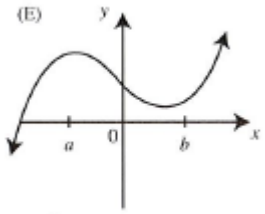


a. 

b. 

c. 

d. 

e. 

R2. What is the $\lim_{h\to 0}\dfrac{\csc\left(\frac{\pi}{4}+h\right)-\csc\left(\frac{\pi}{4}\right)}{h}$

a. $\sqrt{2}$
b. $-\sqrt{2}$
c. 0
d. $-\dfrac{\sqrt{2}}{2}$
e. undefined

R3. If a function is continuous for all values of x, which of the following statements is always true?

I. $2\int_a^b f(x)dx = \int_{2a}^{2b} f(x)dx$

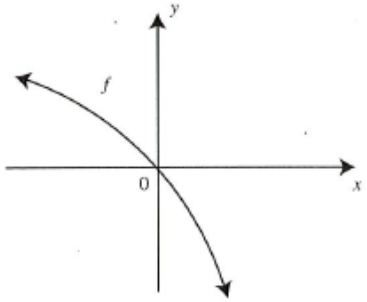
II. $\int_a^b f(x)dx = \int_b^a -f(x)dx$

III. $\left|\int_a^b f(x)dx\right| = \int_a^b |f(x)|dx$

a. I only b. I & II c. II only
d. II & III e. I, II, & III

R4. The graph of f is shown in the figure to the right. f is twice differentiable. Which of the following has the largest value: $f(0)$, $f'(0)$, $f''(0)$

a. f(0) b. f'(0) c. f''(0)
d. f(0) & f'(0) e. f'(0) & f''(0)



Answers:

1. C	2. C	3. D	4. D	5. D	6. C	7. C	8. D
9. C	10. C	11. C	12. C	13. C	14. C	15. D	16. C
17. C	18. C	19. D	20. C	21. Conditional		22. Conditional	
23. Diverge		24. Absolute		R1. D	R2. B	R3. C	R4. A