BC Calculus　　　　　　　　　　　　　　　　　Name_____________________Pd.____

Supplement: Integral, P-Series, & Comparison　　Infinite Series Day 3

Use the **integral test** to determine whether the series is convergent or divergent.

1. $\sum_{n=25}^{\infty} \frac{n^2}{\left(n^3+9\right)^{\frac{5}{2}}}$

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

Use the **p-series test** to determine whether the series is convergent or divergent.

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

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

Use the **comparison test** to determine whether the series is convergent or divergent.

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

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

7.-16. Use the geometric, divergent, integral, p-series, or comparison test to determine if the series is convergent or divergent. I used each test twice. Use the QR codes to determine the method I used. More than one method can work. You should get the same answer no matter the method.

7. $\sum_{n=1}^{\infty} \frac{1}{n2^n}$

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

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

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

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11. $\sum_{n=1}^{\infty} 10(0.25)^{n-1}$

12. $\sum_{n=5}^{\infty} \frac{1}{\sqrt{n-4}}$

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

14. $\sum_{n=25}^{\infty} \frac{n}{n^2+1}$

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

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

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17.-20. Use the **integral test** to determine whether the series is convergent or divergent.

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

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

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

20. $\sum_{n=1}^{\infty} n^2 e^{-n^3}$

21.-26. Determine whether the series is convergent or divergent.

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

22. $\sum_{n=1}^{\infty} n^{-0.9999}$

23. $1+\frac{1}{8}+\frac{1}{27}+\frac{1}{64}+\frac{1}{125}+....$

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

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

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

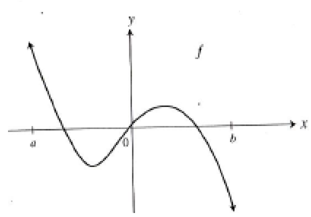
Review

R1. The graph of the function f is shown in the figure, which of the following statements are true?

I. $f'(0)=0$

II. f has an absolute maximum value on [a,b]

III. $f''<0 \; on \; (0,b)$



a. I | b. II | c. III | d. I&II | e. all

R2. $\int \frac{1+x}{\sqrt{x}}dx=$

a. $2\sqrt{x}+\frac{x^2}{2}+C$

b. $\frac{\sqrt{x}}{2}+\frac{3x^{\frac{3}{2}}}{2}+C$

c. $2\sqrt{x}+\frac{2x^{\frac{3}{2}}}{3}+C$

d. $x+\frac{2x^{\frac{3}{2}}}{3}+C$

e. 0

Answers

1. $\int=\frac{2}{9\left(25^3+9\right)^{\frac{3}{2}}}\therefore converges$
2. $\int=\frac{1}{2e}\therefore converges$
3. Diverges
4. Converges
5. Diverges
6. Converges
7. Converges
8. Converges
9. Diverges
10. Converges
11. Converges
12. Diverges
13. $\int=\infty\therefore diverges$
14. $\int=\infty\therefore diverges$
15. Diverges
16. Diverges
17. $\int=\infty\therefore diverges$
18. $\int=\frac{1}{36}\therefore converges$
19. $\int=\infty\therefore diverges$
20. $\int=\frac{1}{3e}\therefore converges$
21. Converges
22. Diverges
23. Converges
24. Converges
25. $\int=\infty\therefore diverges$
26. $\int=e-1\therefore converges$

R1. C R2. C