BC Calculus   Name_____Pd.____
Supplement: Absolute vs Conditional   Infinite Series Day 8

Test	What does it look Like?	Converge & Diverge
Geometric		Converge: Diverge:
Divergent		Converge: Diverge:
Harmonic/Telescoping		Converge: Diverge:
Integral		Converge: Diverge:
P-Series		Converge: Diverge:
Comparison		Converge: Diverge:
Alternating		Converge: Diverge:
Ratio		Converge: Diverge:
Conditional V.S. Absolute		Conditional Convergence Absolute Convergence

Show that each series is absolutely convergent, conditionally convergent, or divergent.

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

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

3. $\sum_{n=1}^{\infty} \dfrac{5n^3 - 3n}{\left(n^3 + n\right)\left(n^2 + 5\right)}$

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

5. $\displaystyle\sum_{n=0}^{\infty} \frac{e^n}{1+e^{2n}}$

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

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

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

9. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}10^n}{n^{10}}$

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

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

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

13. $\displaystyle\sum_{n=1}^{\infty}(-1)^{n+1}(0.1)^{n}$

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

15. $\displaystyle\sum_{n=1}^{\infty}(-1)^{n}n^{2}\left(\frac{2}{3}\right)^{n}$

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

17. $\displaystyle\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n!}{2^{n}}$

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

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

20. $\displaystyle\sum_{n=1}^{\infty}\frac{\cos n\pi}{n\sqrt{n}}$

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

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Review:

R1. $\int_0^8 x^{\frac{2}{3}}dx$

   a. $\dfrac{1}{3}$

   b. $\dfrac{96}{5}$

   c. $\dfrac{4}{3}$

   d. $-\dfrac{1}{3}$

   e. $-\dfrac{96}{5}$

R2. $\lim\limits_{x\to\infty}\dfrac{x^2+4x-5}{x^3-1}$

   a. 0

   b. $\dfrac{1}{3}$

   c. 5

   d. $-\infty$

   e. ∞

R3. What is the $\lim\limits_{x\to-2} f(x)$, if

$f(x) = \begin{cases} |x-1| & \text{if } x > -2 \\ 2x+7 & \text{if } x \le -2 \end{cases}$

   a. -3

   b. 1

   c. 3

   d. 11

   e. nonexistent

R4. $\int_{\frac{\pi}{2}}^{x} 2\cos(t)dt =$

   a. $2\cos x$

   b. $-2\cos x$

   c. $2\sin x$

   d. $-2\sin x + 2$

   e. 2sinx-2

Answers:

1. Converges absolutely	2. Diverges	3. Converges absolutely
4. Diverges	5. Converges absolutely	6. Converges absolutely
7. Diverges	8. Conditionally converges	9. Diverges
10. Conditionally converges	11. Diverges	12. Diverges
13. Converges absolutely	14. Conditionally converges	15. Converges absolutely
16. Conditionally converges	17. Diverges	18. Converges absolutely
19. Conditionally converges	20. Converges absolutely	21. Conditionally converges
R1. B	R2. A	R3. C R4. E