

Determine if the series is convergent or divergent. Indicate which Series Test you used to find your answer.

1. $\sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^n$

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

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

4. $\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n}}$

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

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

7. $\sum_{n=0}^{\infty} \frac{1}{\sqrt{n^3 + 1}}$

8. $\sum_{n=1}^{\infty} \frac{(-1)^n (n+1)}{n-5}$

$$9. \sum_{n=0}^{\infty} \frac{2^n}{n^3}$$

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

$$11. \sum_{n=0}^{\infty} \frac{2^n}{n!}$$

$$12. \sum_{n=0}^{\infty} \frac{n!}{e^n}$$

$$13. \sum_{n=0}^{\infty} e^{-n}$$

$$14. \sum_{n=1}^{\infty} \left(\frac{2n}{5n-1} \right)^n$$

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

$$16. \sum_{n=1}^{\infty} \frac{n}{\sqrt[3]{n^7 + n^4}}$$

$$17. \sum_{n=1}^{\infty} \frac{(n^2 + 3n - 4)}{n!}$$

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

$$19. \sum_{n=3}^{\infty} \frac{n}{(4 + n^2)^{3/4}}$$

$$20. \sum_{n=2}^{\infty} \frac{(2n)!}{(n-1)3^n}$$

21. Determine whether each series converges absolutely, converges conditionally, or diverges. Show your work.

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

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

Review:

R1. $\int \frac{x^4 - 1}{x^2} dx =$

- a. $\frac{x^3}{3} + x + C$
- b. $\frac{x^3}{3} - x + C$
- c. $\frac{x^3}{3} + \frac{3}{x^3} + C$
- d. $\frac{x^3}{3} + \frac{1}{x} + C$
- e. $\frac{x^3}{3} - \frac{1}{x} + C$

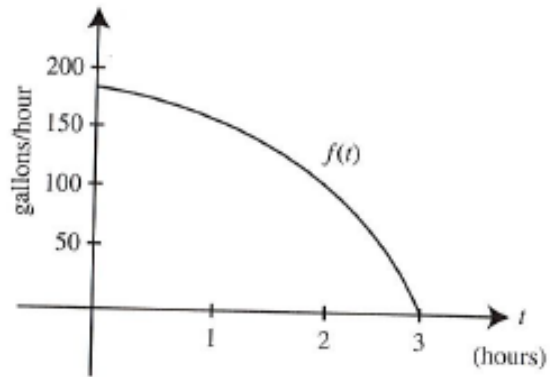
R3. Water is leaking from a tank at a rate represented by $f(t)$ whose graph is shown in the figure to the right. Which of the following is the best approximation of the total amount of water leaked from the tank for $1 \leq t \leq 3$?

- a. $\frac{9}{2}$ gallons
- b. 5 gallons
- c. 175 gallons
- d. 350 gallons
- e. 450 gallons

R2. If $p'(x) = q(x)$ and q is continuous

function for all values of x , then $\int_{-1}^0 q(4x) dx$ is

- a. $p(0) - p(-4)$
- b. $4p(0) - 4p(-4)$
- c. $\frac{1}{4}p(0) - \frac{1}{4}p(-4)$
- d. $\frac{1}{4}p(0) + \frac{1}{4}p(-4)$
- e. $p(0) + p(-4)$



Answers:

- | | | | | |
|--------|---------------|-------|-------|-------|
| 1. C | 2. C | 3. C | 4. D | 5. D |
| 6. C | 7. C | 8. D | 9. D | 10. D |
| 11. C | 12. D | 13. C | 14. C | 15. C |
| 16. C | 17. C | 18. C | 19. D | 20. D |
| 21a. D | 21.b Absolute | R1. D | R2. C | R3. C |