

Calculus BC Classwork 8.1-8.6

For #'s 1–3, determine if the sequence converges or diverges. Find the limit if it converges.

1. $\left\{ \frac{6n^4 - n^2 + 9}{2 + 8n - 15n^4} \right\}_{n=7}^{\infty}$ 2. $\{ \ln(8 + 5n) - \ln(1 + 19n) \}_{n=1}^{\infty}$ 3. $\{ \cos(n\pi) \}_{n=0}^{\infty}$

4. Given $d_n = \frac{3 + 8n}{4 - 7n}$ determine if,

(a) $\{d_n\}_{n=1}^{\infty}$ is a convergent or divergent sequence.

(b) $\sum_{n=1}^{\infty} d_n$ is a convergent or divergent series.

Use the indicated Test to determine whether the series converges or diverges.

Integral Test

5. $\sum_{n=2}^{\infty} \frac{8}{\sqrt[3]{n^2} \sqrt[4]{n}}$

6. $\sum_{n=1}^{\infty} n e^{-\frac{1}{6}n}$

7. $\sum_{n=3}^{\infty} \frac{1}{(6n+1)^{\frac{5}{3}}}$

Direct Comparison / Limit Comparison Test

8. $\sum_{n=1}^{\infty} \frac{\sqrt[3]{n^6 - 4}}{n^7 + n}$

9. $\sum_{n=2}^{\infty} \frac{4 \cos^2(n) + 7n^2}{n^3 e^{-n}}$

10. $\sum_{n=1}^{\infty} \frac{n^4 - n^2 - 3}{n^5 + n^3 + 7}$

Alternating Series Test

11. $\sum_{n=0}^{\infty} \frac{\cos(n\pi)}{n^2 + 4}$

12. $\sum_{n=0}^{\infty} \frac{(-1)^{n-5} n}{2 + n^2}$

13. $\sum_{n=1}^{\infty} \frac{(-1)^{n+8} (2n+1)}{6n+5}$

Ratio and Root Test

14. $\sum_{n=1}^{\infty} \frac{1 + 8n}{(2n+2)!}$

15. $\sum_{n=1}^{\infty} \frac{3^{1+2n} (n^2 - n)}{6^{n-2}}$

16. $\sum_{n=0}^{\infty} \frac{e^{2n}}{(-3)^{n+1}}$

17. $\sum_{n=2}^{\infty} \left(\frac{2-6n}{4-7n} \right)^{3-n}$