

1.  $L = \frac{1}{2} \left( \pi - \frac{3\sqrt{3}}{4} \right)$
2.  $L = \ln \left( \sqrt{4\pi^2 + 1} + 2\pi \right) - \frac{\sqrt{4\pi^2 + 1}}{2\pi} - \ln \left( \sqrt{\pi^2 + 1} + \pi \right) + \frac{\sqrt{\pi^2 + 1}}{\pi}$
3. The sequence diverges
4. 0
5. 1
6.  $\frac{11}{6}$
7.  $\cos(1) - 1$
8.  $\frac{\pi^2}{6 - \pi}$
9.  $-\frac{1}{35}$
10. converges by the integral test
11. diverges by the integral test
12. converges by the comparison test
13. diverges by the comparison test
14. converges by the alternating series test
15. converges by the alternating series test
16. converges by the root test and it converges absolutely
17. diverges by the ratio test
18.  $R = \infty$  and the interval of convergence is  $(-\infty, \infty)$
19.  $R = \frac{1}{10}$  and the interval of convergence is  $\left[ \frac{49}{10}, \frac{51}{10} \right]$
20.  $R = \infty$  and the interval of convergence is  $(-\infty, \infty)$
21.  $R = \frac{1}{2}$  and the interval of convergence is  $\left[ \frac{7}{2}, \frac{9}{2} \right)$

$$\mathbf{22.} \quad a_n = \frac{2}{25n^2 + 15n - 4} \quad \text{and} \quad \sum_{n=1}^{\infty} a_n = \frac{3}{5}$$

$$\mathbf{23.} \quad a_n = \frac{\pi^2 - 1}{36n^2 - 24n - 5} \quad \text{and} \quad \sum_{n=1}^{\infty} a_n = \frac{\pi^2}{6}$$