Math 122 - #20
Series

Determine if the series converge or diverge, and if it converges, find the sum:

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

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

3. $\sum_{n=0}^{\infty} 3\left(\frac{4}{3}\right)^n$

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

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

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

In the following problems, use the Divergence test to determine if the following series diverge. Your answer for each problem should be either the series diverges or you cannot tell by the Divergence test.

7. $\sum_{n=0}^{\infty} \frac{n^3+3n^2+4n+5}{2n^3+n^2+7n+3}$

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

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

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

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

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

13. $\sum_{n=10}^{\infty} \frac{4}{n-4}$

14. $\sum_{n=0}^{\infty} \frac{n^4}{4^n}$

15. $\sum_{n=0}^{\infty} \frac{1}{1+e^{-n}}$

16. $\sum_{n=0}^{\infty} \left(\frac{3}{4}\right)^n$

Answers

1. 2

2. 6

3. Diverges

4. $\frac{3}{2}$

5. 1

6. 1

7. Diverge

8. Can't Tell

9. Diverge

10. Can't Tell

11. Diverge

12. Diverge

13. Can't Tell

14. Can't Tell

15. Diverge

16. Can't Tell