

MAC 2312
Idris Mercer, Spring 2020
Miscellaneous series practice
You do not need to hand this in.

Question 1. Determine whether the series converges or diverges.

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

Question 2. Determine whether the series converges or diverges.

$$\sum_{n=0}^{\infty} \frac{1}{n+4}$$

Question 3. Determine whether the series converges or diverges.

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

Question 4. Determine whether the series converges or diverges.

$$\sum_{n=0}^{\infty} e^{-2n}$$

Question 5. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{2}{10^n}$$

Question 6. Determine whether the series converges or diverges.

$$\sum_{n=0}^{\infty} \frac{n!}{1000^n}$$

Question 7. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{2^n + 4^n}{3^n + 4^n}$$

Question 8. Determine whether the series converges or diverges.

$$\sum_{n=2}^{\infty} \frac{\ln n}{n}$$

Question 9. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{n^2}{e^n}$$

Question 10. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{7}{\sqrt{n+4}}$$

Question 11. Determine whether the series converges or diverges.

$$\sum_{n=2}^{\infty} \frac{1}{5n + 10\sqrt{n}}$$

Question 12. Determine whether the series converges or diverges.

$$\sum_{n=2}^{\infty} \frac{\ln n}{\sqrt{n}}$$

Question 13. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{5^n}{4^n + 3}$$

Question 14. Determine whether the series converges or diverges.

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

Question 15. Determine whether the series converges or diverges.

$$\sum_{n=2}^{\infty} \frac{\sqrt{n}}{\ln n}$$

Question 16. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{\cos^2 n}{n^{3/2}}$$

Question 17. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{1}{n3^n}$$

Question 18. Determine whether the series converges or diverges.

$$\sum_{n=2}^{\infty} \frac{\ln n}{n^2}$$

Question 19. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{n!}{n^2}$$

Question 20. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{2^n}{n3^n}$$

Question 21. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{n^{1.4}}{2^n}$$

Question 22. Determine whether the series converges or diverges.

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

Question 23. Determine whether the series converges or diverges.

$$\sum_{n=1}^{\infty} \frac{2 + (-1)^n}{1.25^n}$$

Question 24. Determine whether the series converges or diverges.

$$\sum_{n=0}^{\infty} \frac{(n!)^2}{(2n)!}$$

Question 25. Determine whether the series converges absolutely, converges conditionally, or diverges.

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

Question 26. Determine whether the series converges absolutely, converges conditionally, or diverges.

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

Question 27. Determine whether the series converges absolutely, converges conditionally, or diverges.

$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n3^n}$$

Question 28. Determine whether the series converges absolutely, converges conditionally, or diverges.

$$\sum_{n=2}^{\infty} (-1)^n \frac{4}{(\ln n)^2}$$

Question 29. Determine whether the series converges absolutely, converges conditionally, or diverges.

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

Question 30. Determine whether the series converges absolutely, converges conditionally, or diverges.

$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2 + 5}{n^2 + 4}$$