

# The BIG Series WKST

Directions: Test the series for convergence or divergence.

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

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

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

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

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

22.  $\sum_{n=3}^{\infty} \frac{\tan^{-1} n}{n^2 + 1}$

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

13.  $1 + \frac{2}{2} + \frac{3}{6} + \frac{4}{24} + \dots$

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

4.  $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$

14.  $\sum_{n=1}^{\infty} n e^{-n^2}$

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

5.  $\sum_{n=1}^{\infty} n^2 e^{-n}$

15.  $\sum_{n=1}^{\infty} \sin n$

25.  $\sum_{n=1}^{\infty} \frac{\cos n}{4^n}$

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

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

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

7.  $\sum_{n=1}^{\infty} \frac{3^n n^2}{n!}$

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

27.  $\sum_{n=1}^{\infty} \frac{1}{n + \sqrt{n^2 - 1}}$

8.  $\sum_{n=1}^{\infty} (-1)^n 2^{1/n}$

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

28.  $\sum_{n=1}^{\infty} \left( \left(\frac{3}{4}\right)^n + \left(\frac{4}{3}\right)^n \right)$

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

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

29.  $\sum_{n=1}^{\infty} (n^{-1.4} + 3n^{-1.2})$

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

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

30.  $1 + \frac{1}{2\sqrt{2}} + \frac{1}{3\sqrt{3}} + \frac{1}{4\sqrt{4}} + \dots$

## ANSWERS:

1. divergent
2. convergent
3. convergent
4. divergent
5. convergent
6. convergent
7. convergent
8. divergent

9. divergent
10. convergent
11. divergent
12. divergent
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24. convergent

25. convergent
26. divergent
27. divergent
28. divergent
29. convergent
30. convergent