

Test the series for convergence or divergence.

$$1) \quad -\frac{1}{3} + \frac{2}{4} - \frac{3}{5} + \frac{4}{6} - \frac{5}{7} + \dots$$

$$2) \quad \frac{1}{\ln 2} - \frac{1}{\ln 3} + \frac{1}{\ln 4} - \frac{1}{\ln 5} + \frac{1}{\ln 6} - \dots$$

$$3) \quad \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}}$$

$$4) \quad \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{3n-1}$$

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

$$6) \sum_{n=1}^{\infty} (-1)^n \frac{2n}{4n^2+1}$$

$$7) \sum_{n=1}^{\infty} (-1)^n \frac{\sqrt{n}}{1+2\sqrt{n}}$$

$$8) \sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2}{n^3+4}$$

$$9) \sum_{n=1}^{\infty} (-1)^{n-1} \frac{e^{1/n}}{n}$$

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

$$11) \sum_{n=1}^{\infty} \frac{\cos n\pi}{n^{3/4}}$$

$$12) \sum_{n=1}^{\infty} (-1)^n \sin\left(\frac{\pi}{n}\right)$$

$$13) \sum_{n=1}^{\infty} (-1)^n \frac{n^n}{n!}$$

How many terms of the series do we need to add in order to find the sum to the indicated accuracy?

$$14) \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n^2} \quad |\text{error}| < 0.01$$

$$15) \sum_{n=1}^{\infty} \frac{(-2)^n}{n!} \quad |\text{error}| < 0.01$$

Approximate the sum of the series correct to four decimal places.

$$16) \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^5}$$

$$17) \sum_{n=1}^{\infty} \frac{(-1)^n n}{8^n}$$