

# Worksheet: Conditional and Absolute Convergence



**Q1:** Consider the series  $\sum_{n=0}^{\infty} \frac{(-1)^n}{2n+1}$ .

Decide whether the series is absolutely convergent, conditionally convergent, or divergent.

A Absolutely convergent

B Divergent

C Conditionally convergent

**Q2:** Consider the series  $\sum_{n=0}^{\infty} \frac{\cos(n)}{(-2)^n}$ .

Decide whether the series is absolutely convergent, conditionally convergent, or divergent.

A Absolutely convergent

B Divergent

C Conditionally convergent

**Q3:** State whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} (\ln(2n+1) - \ln(2n))$  converges absolutely, conditionally, or not at all.

A It converges conditionally.

B It converges absolutely.

C It does not converge at all.

**Q4:** State whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} \left( \frac{3}{n+1} - \frac{3}{n+2} \right)$  converges absolutely, conditionally, or not at all.

A It converges conditionally.

B It converges absolutely.

C It does not converge at all.

**Q5:** State whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{2}{\sqrt{n+1}}$  converges absolutely, conditionally, or not at all.

A It does not converge at all.

B It converges conditionally.

C It converges absolutely.

**Q6:** State whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} \left( \frac{1}{\sqrt{n+2}} - \frac{1}{\sqrt{n+3}} \right)$  converges absolutely, conditionally, or not at all.

A It does not converge at all.

B It converges conditionally.

C It converges absolutely.

**Q7:** State whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} n^n$  converges absolutely, conditionally, or not at all.

A It does not converge at all.

B It converges absolutely.

C It converges conditionally.

**Q8:** Consider the series  $\sum_{n=1}^{\infty} \frac{(-1)^{n+2}}{4n-1}$ .

Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

A Conditionally convergent

B Absolutely convergent

C Divergent

**Q9:** Consider the series  $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2 + 1}$ . Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

A Divergent

B Conditionally convergent

C Absolutely convergent

**Q10:** Consider the series  $\sum_{n=1}^{\infty} \frac{\sin n}{n^3}$ . Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

A Conditionally convergent

B Divergent

C Absolutely convergent