1. The error in approximating the sum of the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{5^n}$ by the sum of the first four terms is less than or equal to

(a) $\frac{4}{5^5}$

(b) $\frac{1}{5^5}$

(c) $\frac{1}{5^4}$

(d) $\frac{1}{4.5^4}$

(e) $\frac{6}{5^6}$

2. The series $\sum_{k=1}^{\infty} k^2 \sin^2\left(\frac{1}{k}\right)$

(a) converges by the root test

(b) converges to 0

(c) has sum $\frac{1}{2}$

(d) is divergent

(e) converges and its sum is 1
1. The series \(1 + \frac{1}{2\sqrt{2}} + \frac{1}{3\sqrt{3}} + \frac{1}{4\sqrt{4}} + \cdots\) is
   
   (a) a divergent \( p \)-series with \( p = \frac{1}{2} \)
   
   (b) a divergent series
   
   (c) a convergent series with \( p = 2 \)
   
   (d) a divergent series by the integral test
   
   (e) a convergent series with \( p = 5/2 \)

2. The series \( \sum_{k=1}^{\infty} (-1)^{k-1} \frac{k}{k^2 + 5} \)
   
   (a) is conditionally convergent
   
   (b) has sum \( \frac{2}{3} \)
   
   (c) is absolutely convergent
   
   (d) is divergent
   
   (e) is not convergent by the alternating series test
1. The series \( \sum_{k=1}^{\infty} \frac{(-1)^k \sqrt{k}}{k + 1} \)

(a) is absolutely convergent
(b) is conditionally convergent
(c) has the sum \( \frac{1}{9} \)
(d) is divergent
(e) is absolutely divergent

2. The series \( \sum_{n=1}^{\infty} (\sqrt[3]{2} - 1)^n \) is

(a) convergent by the root test
(b) divergent by the root test
(c) a convergent geometric series
(d) a series in which the root test is inclusive
(e) divergent by the test of divergence
1. The series \( \sum_{n=2}^{\infty} \frac{1}{n \ln n} \) is
   (a) convergent by the ratio test
   (b) divergent by the integral test
   (c) convergent by the comparison test
   (d) convergent because \( \lim_{n \to \infty} \frac{1}{n \ln n} = 0 \)
   (e) convergent by the integral test

2. The series \( \sum_{n=1}^{\infty} (-1)^{n-1} \frac{n}{n^3 + 1} \)
   (a) is divergent
   (b) is conditionally convergent
   (c) converges and has sum 7
   (d) is absolutely convergent
   (e) is convergent and has sum \( e^3 \)