
Exam 2 Review T/F

1. T/F (with justification): The work required to stretch a spring having spring constant k a distance x from its equilibrium (rest) position is kx .
2. T/F (with justification): Every bounded sequence is convergent.
3. T/F (with justification): If $a_n \rightarrow 0$ as $n \rightarrow \infty$ then the series $\sum_{n=1}^{\infty} a_n$ converges.
4. T/F (with justification): The convergence of a series $\sum_{n=1}^{\infty} a_n$ is unaffected by dropping its first few terms.
5. T/F (with justification): If $f(x)$ is continuous, positive, and decreasing for $x \geq 1$, and $\int_1^{\infty} f(x) dx$ converges then $\sum_{n=1}^{\infty} f(n) = \int_1^{\infty} f(x) dx$.
6. T/F (with justification)
The divergence of p -series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ for $0 < p < 1$ follows from divergence of the harmonic series $\sum_{n=1}^{\infty} \frac{1}{n}$ by the comparison test.
7. T/F (with justification)
The convergence of p -series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ for $p > 1$ follows from divergence of the harmonic series $\sum_{n=1}^{\infty} \frac{1}{n}$ by the comparison test.
8. T/F (with justification)
The infinite series $\sum_{n=1}^{\infty} \frac{\cos n}{n}$ is alternating.

9. T/F (with justification)

For the alternating series $s = \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{2n+1}$, s lies between s_{100} and s_{101} .

10. T/F (with justification)

Convergence of a p -series for $p > 1$ can be shown with the ratio test.

11. T/F (with justification)

There is an infinite series whose terms can be rearranged to be an infinite series with a different value.

12. The geometric series $\sum_{n=4}^{\infty} \left(\frac{1}{3}\right)^n$ converges to $\frac{3}{2}$.

13. The series $\sum_{k=1}^{\infty} \frac{(-1)^k}{k^3}$ converges conditionally.

14. If $\sum_{n=1}^{\infty} |a_n|$ diverges then $\sum_{n=1}^{\infty} a_n$ diverges.