Calc BC Comparison Test

Name: Block: Seat:

Direct Comparison Test This test is used when a known series is bigger than the given series.

1. If a_n has no negative terms, and a ceiling function $\sum_k^\infty b_n$ converges, then $\sum_k^\infty a_n$ must also converge.

2. If a_n has no negative terms, and a floor function $\sum_k^\infty b_n$ diverges, then $\sum_k^\infty a_n$ must also diverge.

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

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

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

Limit Comparison Test This is one of the most useful tests for determining convergence. Suppose $a_n > 0$ and $b_n > 0$ for all $n > N$ where N is a positive integer.

- If $\lim_{n\to\infty} \dfrac{a_n}{b_n} = c$, $0 < c < \infty$, then $\sum a_n$ and $\sum b_n$ behave the same.
- If $\lim_{n\to\infty} \dfrac{a_n}{b_n} = 0$, and b_n converges, then $\sum a_n$ converges.
- If $\lim_{n\to\infty} \dfrac{a_n}{b_n} = \infty$, and b_n diverges, then $\sum a_n$ diverges.

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

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

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