

**Math 152 Week in Review:** Section 11.4

**The Comparison Test (Strict Comparison):** Suppose that  $\sum a_n$  and  $\sum b_n$  are series with positive terms.

(a) If  $\sum b_n$  is convergent and  $a_n \leq b_n$  for all  $n$ , then  $\sum a_n$  is also convergent.

(b) If  $\sum b_n$  is divergent and  $a_n \geq b_n$  for all  $n$ , then  $\sum a_n$  is also divergent.

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**Limit Comparison Test(LCT):** Suppose that  $\sum a_n$  and  $\sum b_n$  are series with positive terms and

$$\lim_{n \rightarrow \infty} \frac{a_n}{b_n} = L$$

If  $L$  is a number greater than zero,  $L > 0$ , then both series converge or both series diverge.

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Determine if the series converges or diverges.

1. 
$$\sum_{n=1}^{\infty} \frac{3^n - 1}{5n + 4^n}$$

$$2. \sum_{n=4}^{\infty} \frac{1}{\sqrt[3]{n^2 - 3}}$$

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

$$4. \sum_{n=1}^{\infty} \frac{\sqrt{n+1}}{(2n+5)^4}$$

$$5. \sum_{n=1}^{\infty} \frac{\ln(n)}{\sqrt{n}}$$

$$6. \sum_{n=4}^{\infty} \frac{4n^3 + 7n^2}{\sqrt{3n^2 + n^{10} + 5}}$$

$$7. \sum_{n=1}^{\infty} \frac{2ne^{-n}}{n^3 + 4n^2}$$

$$8. \sum_{n=3}^{\infty} \frac{5 - \sin^2(n)}{\sqrt{n-1}}$$