Calculus Section 9.4 Direct Comparison Test
-Use the direct comparison test to determine convergence.

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The convergence tests so far (nth-term, geometric, integral, and p-series) have been fairly simple and the series have special characteristics that make finding convergence easy. Any slight deviation from those characteristics can yield a series where the previous tests would not apply. For example,
1) is geometric, but is not.

2) is a p-series, but is not.

3) is easily integrated, but is not.

The direct comparison test is a tool that we can use to determine convergence for complicated, positive series by comparing them with simpler series.

**Direct Comparison Test**Let 0 < an ≤ bn for all n.
1) 
2) 

**Example) Determine Convergence or Divergence**

$$\sum\_{n=1}^{\infty }\frac{1}{\sqrt{n}-2}$$

$$\sum\_{n=1}^{\infty }\frac{1}{2+3^{n}}$$

1) 2)

3)

$$\sum\_{n=1}^{\infty }\frac{1}{4\sqrt[3]{n}-1}$$