Section 9.3 Integral Test and p-series

Integrals are a sum of infinite rectangles under a curve, so they should be related to infinite series.

**Integral Test**

If is positive, continuous and decreasing for and , then

* if converges, then converges
* if diverges, then diverges

**Example**: Converge or diverge? \* Nth term test?

 \* Telescopic Series?

 \* Geometric Series?

 \* Is positive, continuous and decreasing for

**Example**: Converge or diverge? \* Nth term test?

 \* Telescopic Series?

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 \* Is positive, continuous and decreasing for

A series in the form is called a **p-series**.

When p = 1, . This series is called the **harmonic series**.

(In music, the wavelengths of overtones of a vibrating string form a harmonic series.)

We looked at p-integrals earlier this year. What values of p caused the integral to converge?

In p-series, if p > 1, the series converges. This was proven by integration earlier.

 If , the series diverges.

Examples: Converge or Diverge?

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