Watch. Practice. Understand. | Lesson 338

2022 Calculus BC or Calculus II Integral Test and P Series Test (Rokawski 10.3)

Watch the matching video: https://www.youtube.com/watch?v=rWrkrHox4dw

Practice focus: Integral test and p-series

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Determine convergence of sum from n=1 to infinity of $1/n^2$.

02 Determine convergence of sum from n=1 to infinity of $1/\sqrt{n}$.

03 Use the integral test on sum from n=2 to infinity of $1/(n \ln n)$.

04 Bound the tail after N terms of sum $1/n^2$ using integrals.

Worked answers | Lesson 338

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Practice focus: Integral test and p-series

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01 Determine convergence of sum from n=1 to infinity of $1/n^2$.

p-series with p=2>1: convergent.

02 Determine convergence of sum from n=1 to infinity of $1/\sqrt{n}$.

p=1/2<=1: divergent.

03 Use the integral test on sum from n=2 to infinity of 1/(n ln n).

f is positive, continuous and decreasing on [2,infinity). Its integral ln(ln x) diverges, so the series diverges.

04 Bound the tail after N terms of sum $1/n^2$ using integrals.

Integral_(N+1)^infinity x^-2 dx <= R_N <= integral_N^infinity x^-2 dx. Thus 1/(N+1)<=R_N<=1/N.