Watch. Practice. Understand. | Lesson 346

The Secret of Radius and Interval of Convergence of a Power Series in 2022 Calculus BC...

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

Practice focus: Power series and intervals of convergence

Original extra practice matched to the listed lesson topic.

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

01 Find radius and interval of convergence of sum x^n, n>=0.

02 Find radius and interval for sum (x-2)^n/(n3^n), n>=1.

03 Write a power series for $1/(1-x)^2$ valid for $|x|<1$.

04 Integrate the geometric series from0 to x to obtain a series for -ln(1-x).

Worked answers | Lesson 346

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Practice focus: Power series and intervals of convergence

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01 Find radius and interval of convergence of sum x^n, n>=0.

Geometric series converges for |x|<1; at ±1 terms fail to approach0. Radius1, interval(-1,1).

02 Find radius and interval for sum (x-2)^n/(n3^n), n>=1.

Ratio gives |x-2|<3. At x=-1: alternating harmonic converges; at x=5: harmonic diverges. Radius3; interval[-1,5).

03 Write a power series for $1/(1-x)^2$ valid for |x|<1.

Differentiate geometric series: sum from n=1 to infinity of n x^(n-1).

04 Integrate the geometric series from0 to x to obtain a series for -ln(1-x).

Termwise integration gives sum x^(n+1)/(n+1), n>=0, for |x|<1. This is -ln(1-x).