

Calculus BC 2018 Free Respond Questions Non Calculator Analysis

Lesson 349 | Calculus BC | Displacement and distance • Separable differential equations and slope fields • Power series and intervals of convergence

<https://www.youtube.com/watch?v=vyafMWRVbi0>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

01

A particle has $v(t)=11(t-8)$ on $0 \leq t \leq 14$. Find displacement and total distance.

02

Solve $dy/dx=6y$ with $y(0)=13$. Give the initial slope and explain the sign of the solution.

03

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-1)^m/(12^m m)$. Check both endpoints.

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04

A particle has $v(t)=11(t-2)$ on $0 \leq t \leq 7$. Find displacement and total distance.

05

Solve $dy/dx=14y$ with $y(0)=5$. Give the initial slope and explain the sign of the solution.

06

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-0)^m/(4^m m)$. Check both endpoints.

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01

A particle has $v(t)=11(t-8)$ on $0 \leq t \leq 14$. Find displacement and total distance.

Velocity changes sign at $t=8$. Displacement = $11[t^2/2-8t]_0^{14}=-154$. Distance adds the magnitudes of the two triangular areas: 550.

02

Solve $dy/dx=6y$ with $y(0)=13$. Give the initial slope and explain the sign of the solution.

Separate $dy/y=6dx$. Integrate $\ln|y|=6x+C$; use initial condition: $y=13e^{(6x)}$. Initial slope=78. Exponential and 13 are positive, so $y>0$ for all x .

03

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-1)^m/(12^m m)$. Check both endpoints.

Ratio limit $|x-1|/12$; convergence inside $|x-1|<12$. Radius 12. At $x=13$, harmonic series diverges; at $x=-11$, alternating harmonic series converges. Interval $[-11,13)$.

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04

A particle has $v(t)=11(t-2)$ on $0 \leq t \leq 7$. Find displacement and total distance.

Velocity changes sign at $t=2$. Displacement = $11[t^2/2-2t]_0^7=231/2$. Distance adds the magnitudes of the two triangular areas: $319/2$.

05

Solve $dy/dx=14y$ with $y(0)=5$. Give the initial slope and explain the sign of the solution.

Separate $dy/y=14dx$. Integrate $\ln|y|=14x+C$; use initial condition: $y=5e^{(14x)}$. Initial slope=70. Exponential and 5 are positive, so $y>0$ for all x .

06

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-0)^m/(4^m m)$. Check both endpoints.

Ratio limit $|x-0|/4$; convergence inside $|x-0|<4$. Radius 4. At $x=4$, harmonic series diverges; at $x=-4$, alternating harmonic series converges. Interval $[-4,4)$.