

Calculus BC Free Respond 2018 Calculator Analysis

Lesson 350 | Calculus BC | Displacement and distance • Separable differential equations and slope fields • Power series and intervals of convergence

<https://www.youtube.com/watch?v=cvil6aNQd90>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

01

A particle has $v(t)=5(t-8)$ on $0 \leq t \leq 10$. Find displacement and total distance.

02

Solve $dy/dx=6y$ with $y(0)=2$. 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 $(x-0)^m/(13^m m)$. Check both endpoints.

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04

A particle has $v(t)=13(t-7)$ on $0 \leq t \leq 10$. Find displacement and total distance.

05

Solve $dy/dx=4y$ with $y(0)=9$. 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 $(x-5)^m/(9^m m)$. Check both endpoints.

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01

A particle has $v(t)=5(t-8)$ on $0 \leq t \leq 10$. Find displacement and total distance.

Velocity changes sign at $t=8$. Displacement = $5[t^2/2-8t]_0^{10}=-150$. Distance adds the magnitudes of the two triangular areas: 170.

02

Solve $dy/dx=6y$ with $y(0)=2$. Give the initial slope and explain the sign of the solution.

Separate $dy/y=6dx$. Integrate $\ln|y|=6x+C$; use initial condition: $y=2e^{(6x)}$. Initial slope=12. Exponential and 2 are positive, so $y>0$ for all x .

03

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-0)^m/(13^m m)$. Check both endpoints.

Ratio limit $|x-0|/13$; convergence inside $|x-0|<13$. Radius 13. At $x=13$, harmonic series diverges; at $x=-13$, alternating harmonic series converges. Interval $[-13,13)$.

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04

A particle has $v(t)=13(t-7)$ on $0 \leq t \leq 10$. Find displacement and total distance.

Velocity changes sign at $t=7$. Displacement = $13[t^2/2 - 7t]_0^{10} = -260$. Distance adds the magnitudes of the two triangular areas: 377.

05

Solve $dy/dx=4y$ with $y(0)=9$. Give the initial slope and explain the sign of the solution.

Separate $dy/y=4dx$. Integrate $\ln|y|=4x+C$; use initial condition: $y=9e^{(4x)}$. Initial slope=36. Exponential and 9 are positive, so $y>0$ for all x .

06

Find the radius and interval of convergence of $\sum$ from $m=1$ to ∞ of $(x-5)^m/(9^m m)$. Check both endpoints.

Ratio limit $|x-5|/9$; convergence inside $|x-5|<9$. Radius 9. At $x=4$, harmonic series diverges; at $x=-14$, alternating harmonic series converges. Interval $[-14,4)$.