

Watch. Practice. Understand. | Lesson 317

Integrating By Separating Variables, Calculus AB Integration Technique, Differential Equati...

Watch the matching video: <https://www.youtube.com/watch?v=gQwy2D2bfIM>

Practice focus: Separable differential equations and slope fields

Original extra practice matched to the listed lesson topic.

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

01 Solve $y' = 2xy$ with $y(0) = 3$.

02 For $y' = x - y$, find slopes at $(0,1)$, $(1,1)$, and $(2,1)$.

03 Solve $y' = 3y$ with $y(0) = 2$.

04 Find equilibrium solutions of $y' = y(4 - y)$.

Worked answers | Lesson 317

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01 Solve $y' = 2xy$ with $y(0) = 3$.

Separate $dy/y = 2x \, dx$. $\ln|y| = x^2 + C$, so $y = 3e^{(x^2)}$.

02 For $y' = x - y$, find slopes at $(0,1)$, $(1,1)$, and $(2,1)$.

Substitute coordinates: -1, 0, and 1 respectively.

03 Solve $y' = 3y$ with $y(0) = 2$.

Separate or recognize exponential growth: $y = 2e^{(3t)}$ if independent variable is t ; using x , $y = 2e^{(3x)}$.

04 Find equilibrium solutions of $y' = y(4 - y)$.

Set the derivative to zero: $y = 0$ and $y = 4$ are constant solutions.