Good afternoon

no warm up

volume assessments are being passed back

new handouts:

All: Q4 skills list

new practice assessment (will assess in class Weds.)

Testers: 12 free response problems: first 6 due 4/20; last 6 due 4/24

will be graded by AP key, converted to 100-96-86-66-50

error analysis will count as retake to earn back points

Non-testers: Roller Coaster Project prompt, due 4/28

set with table on pg 1: 4/20

'drainpipe' 4/24

Wed Apr 12 test prep in DS, assess in class, presentation work time

thu Apr 13 testers day for DS: timed FRQ practice

Mon Apr 17(B) Limits/Continuity, Taking Derivatives, Applying Derivatives

thu apr 20: testers stay for DS: finish and turn in first 6 FRQ

Fri Apr 21 Antiderivatives and Riemann, Definite Integrals/FTC

Mon Apr 24: *second 6 FRQ due;* Timed AP multiple choice in class; rollercoaster work tim

Wed Apr 26: AP review problem sets; rollercoaster work time

thu apr 27: testers stay for DS: timed FRQ practice

Fri Apr 28: AP motion review; rollercoaster work time, due at end of class

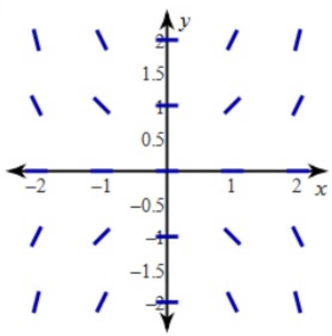
Saturday Apr 29: Timed test here at school, 9a-1230p

donuts and coffee and bananas provided

testers must stay for DS Thursday...suggest that all do honestly!

Slope fields hw

1)



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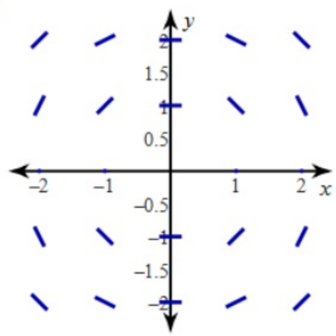

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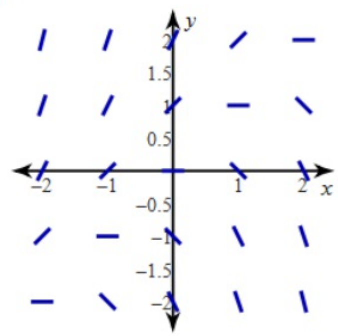
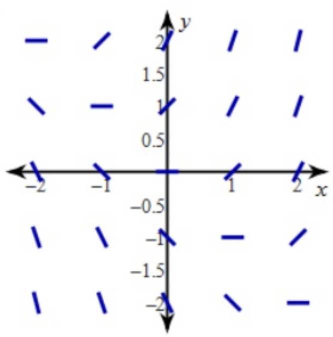


4)



14: E

27: A

middle of the page: C

ex 1: The rate of change of the volume V of water in a tank with respect to time t is directly proportional to the square root of the volume. Write a differential equation that describes this relationship.

$$\frac{dV}{dt} = K\sqrt{V}$$

Constant of proportionality

From the video:

$$\frac{dB}{dt} = k \cdot B \Longrightarrow B(t) = Ce^{kt}$$

Shortcut (good to know)

growth factor

$$\frac{dy}{dt} = kY \longrightarrow Y = C e^{kt}$$

initial population

$dy = ky\,dt$

$\int \frac{dy}{y} = \int k\,dt$

$\ln|y| = kt + c$

$y \quad e^{kt+c} = y \Longrightarrow e^{kt} \cdot \cancel{e^{c}}$ C

$\cancel{e^{t}}$

$$\frac{dF}{dt} = 1.5F$$

$$F(t) = Ce^{1.5t}$$

Separation of Variables: Find y if

y' = 3y+6

$$\left(\frac{dy}{\cancel{dx}} = 3y+6\right)dx$$

sep. of variables

group x's and dx
y's and dy.

$$\frac{dy}{3y+6} = \frac{(\cancel{3y+6})dx}{\cancel{3y+6}}$$

$$\int \frac{1}{3y+6}\,dy = \int 1\,dx$$

Integrate both sides

$$\frac{1}{3}\int 3\,\frac{1}{3y+6}\,dy = x+C$$

$$\frac{1}{3}\left[\ln|3y+6|\right] \cancel{+C} = x+C$$

$$-C$$

$$\left(\frac{1}{3}\ln|3y+6| = x+C\right)3$$

$$\ln|3y+6| = 3x+C$$

$$\log_e|3y+6| = 3x+C \iff e^{3x+C} = 3y+6$$

Expon-
entiation

$$e^{3x}\cdot \cancel{e^{C}} \quad C$$

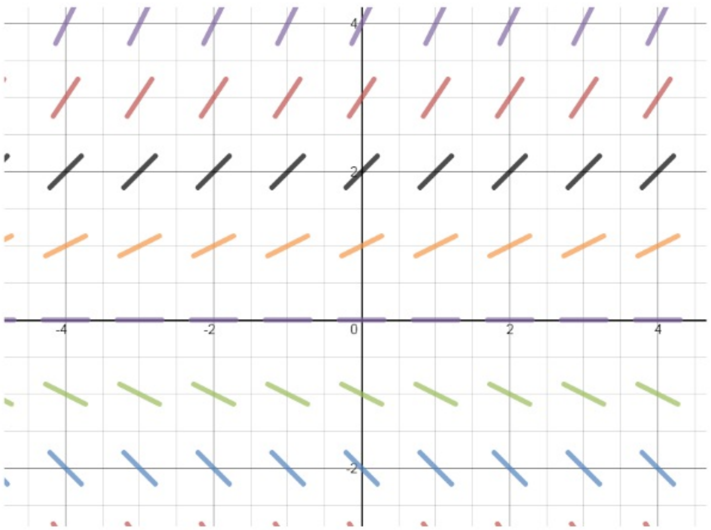
$$Ce^{3x} = 3y+6$$

$$\frac{Ce^{3x}}{3} - \frac{6}{3} = \frac{\cancel{3}y}{\cancel{3}}$$

$$\boxed{Ce^{3x} - 2 = y}$$

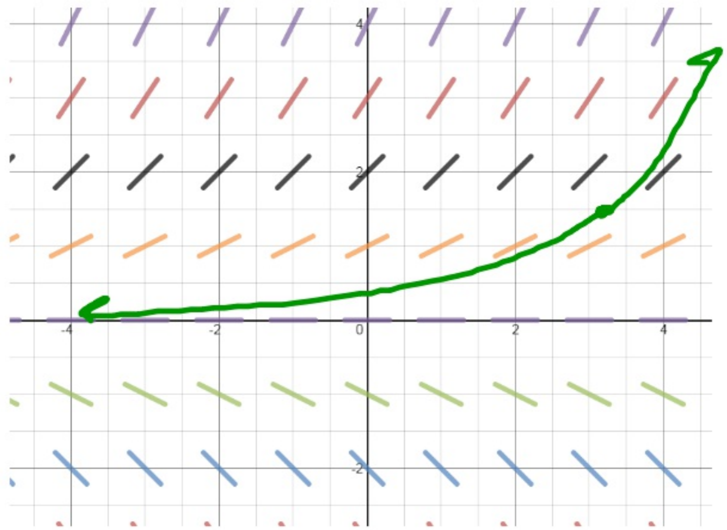
General Solution

$$\frac{dy}{dx} = 2y \qquad y=Ce^{2x}$$



Particular Solution

Initial Condition: (3,2)



Example: Let $\frac{dy}{dx} = \frac{-xy^2}{2}$ Find y with initial condition y(-1)=2

do practice assessment:
solutions will be posted on weebly asap

will study/review/answer q's in DS Wed before real test in class