

Math 10A

Homework #11; Due Tuesday, 7/31/2018

Instructor: Roy Zhao

1. True False If $y' = f(t)$, then the slope field will have the same slopes lined up vertically.
2. True False Euler's method can never give the exact answer for $y(t)$.
3. True False The DE $y' = 3y^2 - y$ will have a slope field with the same slopes lined up horizontally.
4. True False In order to use Euler's method on $y' = 2y - y^2$, we need to calculate the derivative of $2y - y^2$ to find the tangent line.
5. Match up the following four equations with the four slope fields A, B, C, D.

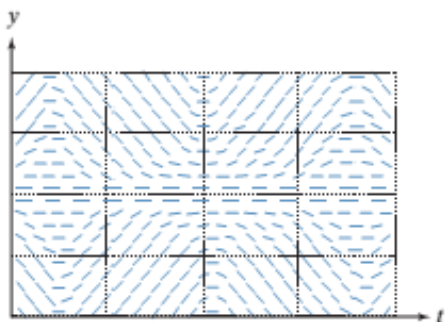
(a) $\frac{dy}{dt} = \sin t$

(b) $\frac{dy}{dt} = t \sin y$

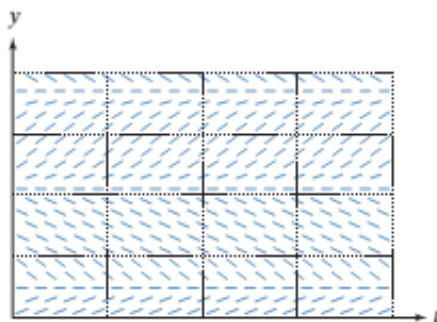
(c) $\frac{dy}{dt} = \sin y$

(d) $\frac{dy}{dt} = y \sin t$

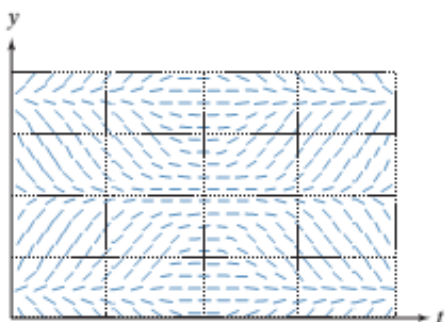
GRAPH A



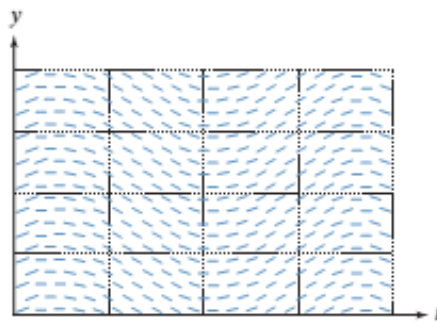
GRAPH C



GRAPH B



GRAPH D



6. Match up the following four equations with the four slope fields E, F, G, H.

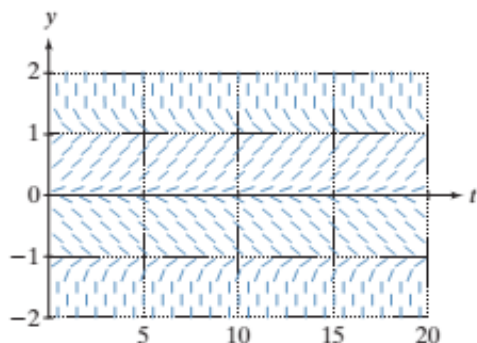
(a) $\frac{dy}{dt} = y(1 - y)(1 + y)$

(b) $\frac{dy}{dt} = \sin t$

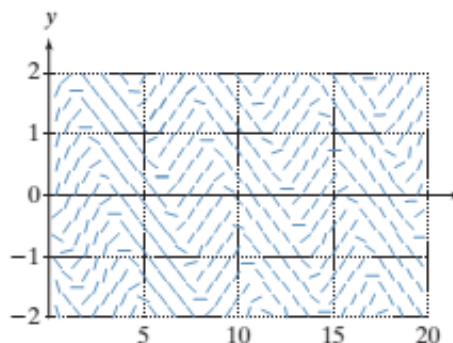
(c) $\frac{dy}{dt} = \sin(t + y)$

(d) $\frac{dy}{dt} = t/10 + y$

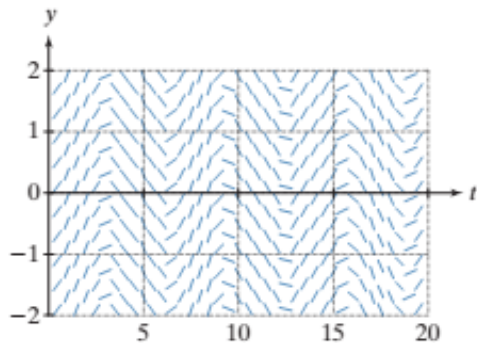
GRAPHE



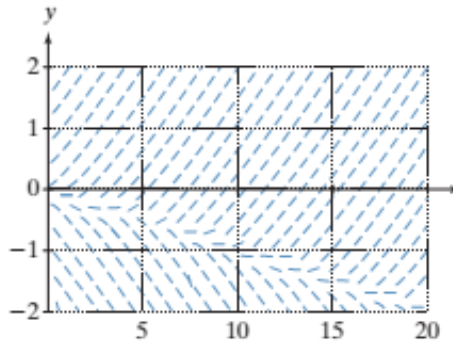
GRAPHG



GRAPHF



GRAPHH



7. Use a calculator and Euler's method with $h = 0.5$ to compute the approximate value of $y(2)$ with $y' = \frac{y^2 + 2ty}{3 + t^2}$ and $y(0) = 0.5$.

8. Use a calculator and Euler's method with $h = 0.5$ to compute the approximate value of $y(2)$ with $y' = 2t + e^{-ty}$ and $y(0) = 1$.

9. For each of the following differential equations, find and classify the equilibria and sketch some solutions.

(a) $y' = 1 - y^2$

(b) $y' = y(5 - y) - 6$

(c) $y' = y(2 - y)(1 - y)^2$

(d) $y' = y(2 - y) - 8$