

MthSc 208: Differential Equations (Fall 2011)
In-class Worksheet 1a: Plotting slope fields

NAME:

Consider the ODE $y' = 2y + t$.

- (a) Draw the ty -plane (i.e., t on the x -axis, and $y(t)$ on the x -axis). Draw a dot at each integer lattice point at each (t, y) , where $t, y = -1, 0, 1$.

- (b) At each of these nine points, compute $y'(t)$. On the ty -plane, draw a “hash mark” at (t, y) with slope $y'(t)$.

- (c) Now, we will use a better method to sketch the slope field. Determine the set of points for which $y' = 0$ (it will be a line – set $y' = 0$ and solve for y .)
- (d) Repeat the previous step except for $y' = c$, for various values of c : 1, 2, 3, -1 , $-\frac{1}{2}$.
- (e) Sketch the lines you found above on the ty -plane. Along each line, sketch the hash-marks of the corresponding slope, $y' = c$.
- (f) In the slope field above, sketch the three particular solution curves that satisfy $y(0) = 1$, $y(0) = -\frac{3}{4}$, and $y(1) = -\frac{3}{4}$, respectively.