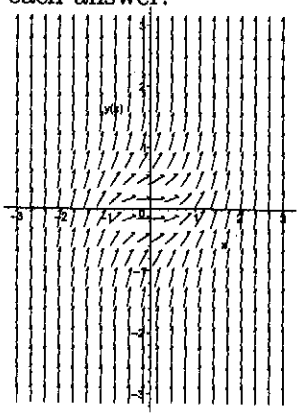
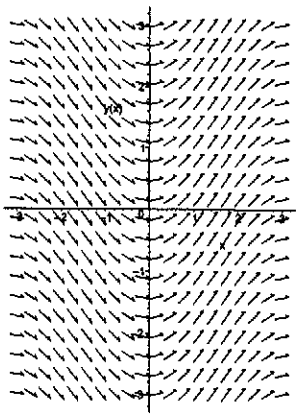
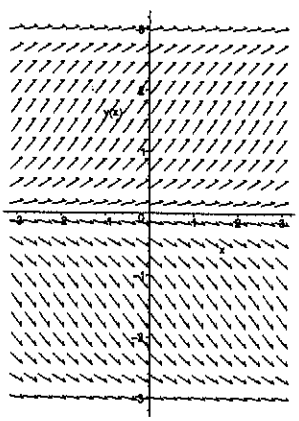
MAP 2302 — QUIZ 3 — SPRING 2014 SOLUTION

(1) [7.5 **points**] Match the direction field plot with the differential equation. Give some reason for each answer.

(A) 

(B) 

(C) 

(i) $\frac{dy}{dx} = \sin(x)$ (B) $\frac{dy}{dx}$ is a function of x only.

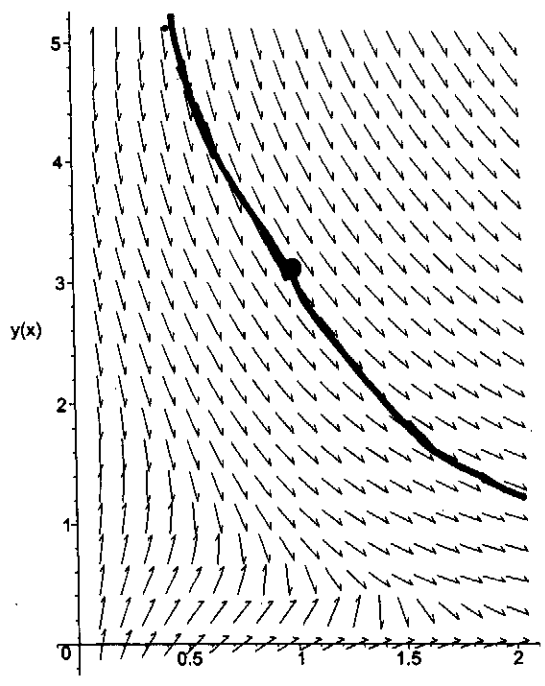
(ii) $\frac{dy}{dx} = \sin(y)$ (C) $\frac{dy}{dx}$ is a function of y only.

(iii) $\frac{dy}{dx} = \sin(x)\,\sin(y)$

(iv) $\frac{dy}{dx} = x^2 + 2y^2$ (A) $\frac{dy}{dx} \geq 0$

(2) [2.5 **points**] Below is the direction field of the differential equation

$$\left(\frac{1}{x} + 2y^2x\right) + \left(2yx^2 - \cos(y)\right)\frac{dy}{dx} = 0.$$



Plot the solution satisfying $y(1) = 3$.