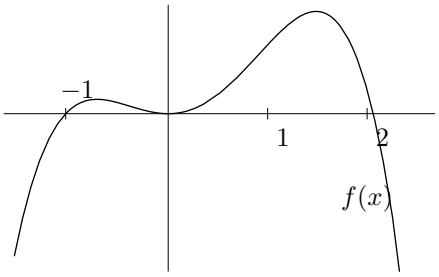
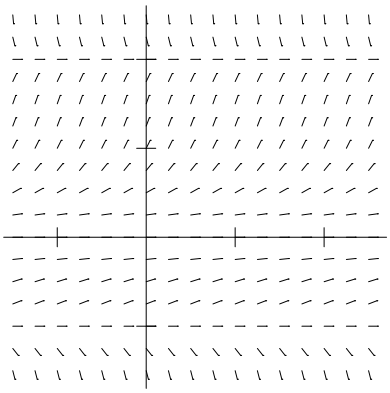
3. [8 points] Suppose that $\frac{dy}{dx} = f(x)$, where $f(x)$ is shown in the graph to the right.



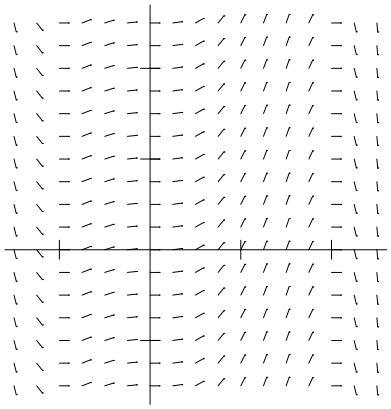
(a) [4 points of 8] Which of the slope fields below (which have ticks with unit spacing) could be the slope field of this differential equation? Explain briefly.

Solution:
The equation matches slope field (B): the slope varies only with x, so it must match (B) or (C), and must be zero at $x = -1$, $x = 0$ and $x \approx 2.1$, so it must be (B).

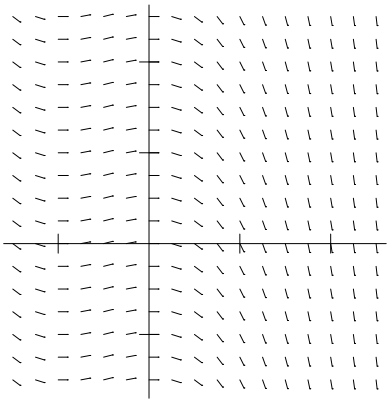
A.



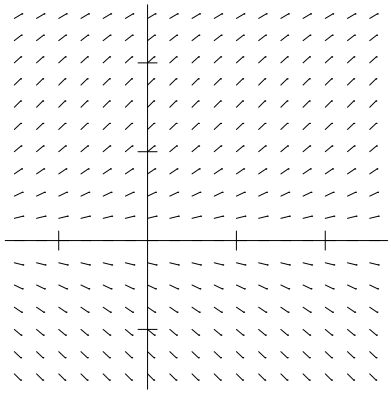
B.



C.



D.



(b) [4 points of 8] Are there any equilibrium solutions to this differential equation? If so, what are they? If not, why not?

Solution:
There are no equilibrium solutions (which are $y =$ constant). Because $\frac{dy}{dx} = f(x)$ (and $f(x)$ is not everywhere zero), there is no way that $y =$ constant can solve the differential equation.