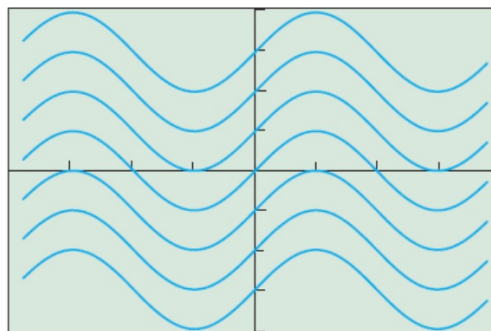


6.1 Slope Fields, cont.

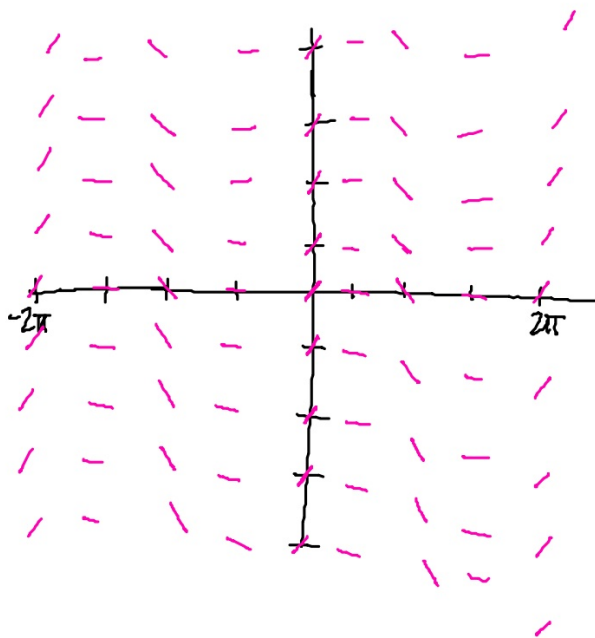
Recall the graph of the family of solutions to the diff. eq. $dy/dx = \cos x$. Suppose we want to produce the graph without actually solving the equation. Since the diff. eq. gives us the slope at any point (x, y) , we can use that info to draw a small piece of the linearization at that point, which approximates the solution curve that passes through that point. Repeating that process at many points yields an approximation of the general solution called a **slope field**.



$[-2\pi, 2\pi]$ by $[-4, 4]$

Ex. 6: Constructing a Slope Field

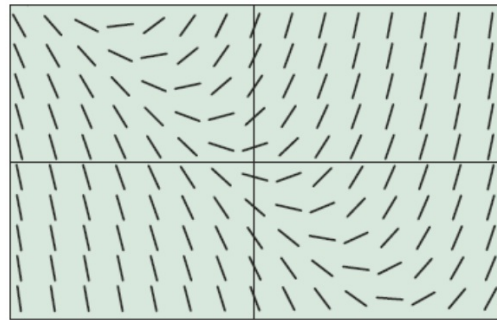
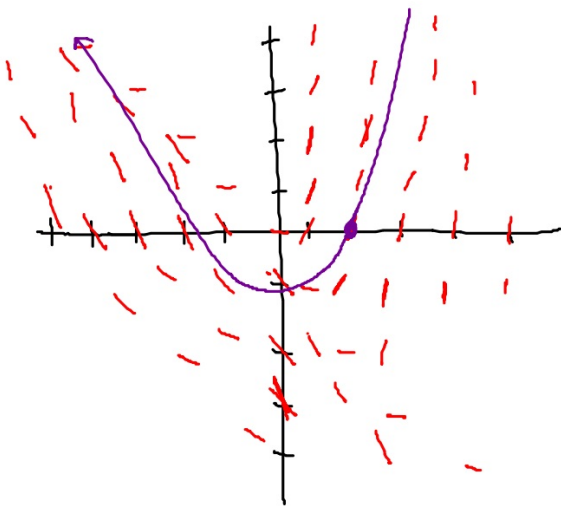
Construct a slope field for the diff. eq. $dy/dx = \cos x$.



Ex. 7: Constructing a Slope Field

Construct a slope field for the diff. eq. $dy/dx = x + y$.
Sketch a graph of the particular solution that passes through the point $(2, 0)$

$$\begin{aligned}x + y &= -1 & x + y &= 0 \\ y &= -x - 1 & y &= -x\end{aligned}$$



[-4.7 4.7] by [-3.1 3.1]



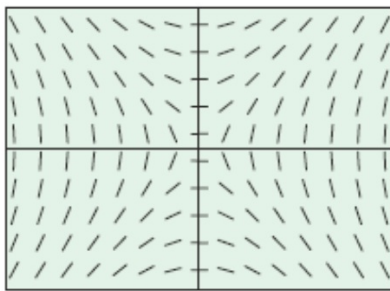
Ex. 8: Use slope analysis to match each of the following diff. eq. with one of the slope fields below.

1. $dy/dx = x - y$ B

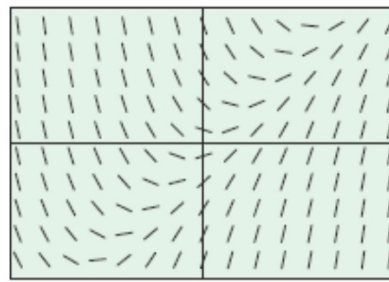
2. $dy/dx = xy$ D

3. $dy/dx = x/y$ A

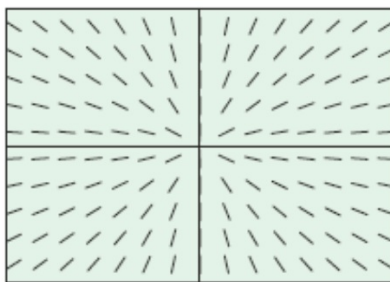
4. $dy/dx = y/x$ C



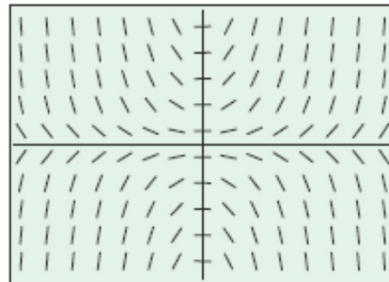
(a)



(b)



(c)



(d)

Assignment
p. 327 #25-28, 29-33 odd, 35-40