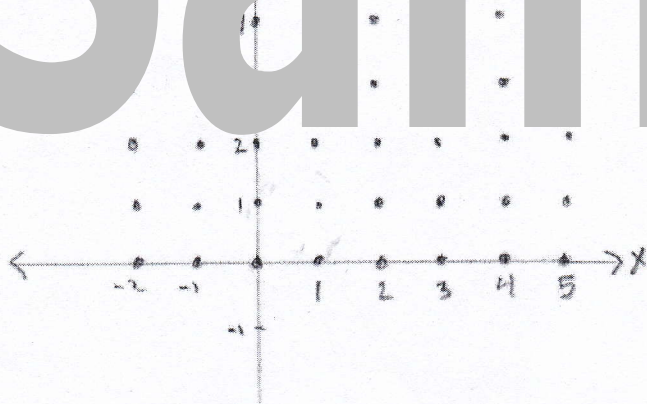


# Sample

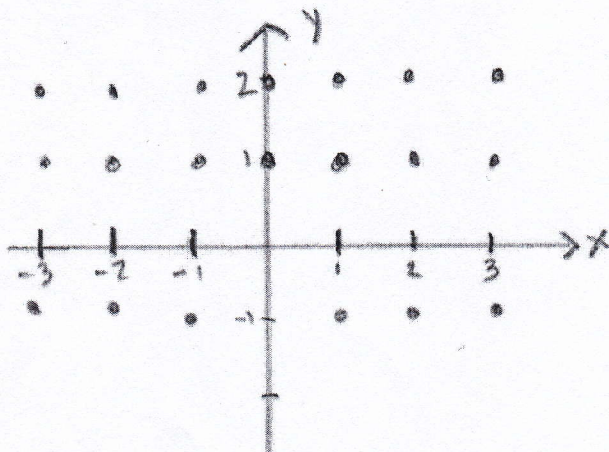
Review: Slope Fields, Differential Equations, Exponential Growth and Decay

Sketch the slope field for  $\frac{dy}{dx} = -y$  at the indicated points below.



- b) Sketch a possible solution curve passing through the point (0,2)
- c) Find the equation of the tangent line at the point (0,2).
- d) Use the tangent line approximation to estimate  $f(0.1)$

2. Draw a slope field for  $\frac{dy}{dx} = \frac{x+2}{y}$  at the indicated points below.



# Sample

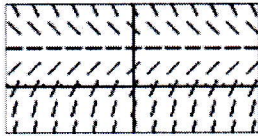
Sketch the graph of the possible solutions of the differential equation  $\frac{dy}{dx} = x + y$  with  $y(0) = 0$ .



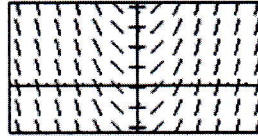
4.

Match the slope fields with their differential equations.

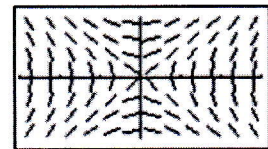
(A)



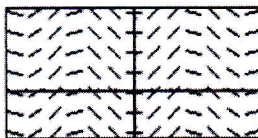
(B)



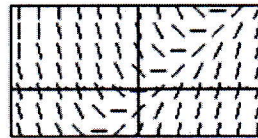
(C)



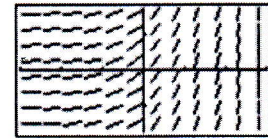
(D)



(E)



(F)



I.  $\frac{dy}{dx} = e^x$

II.  $\frac{dy}{dx} = \frac{x}{y}$

III.  $\frac{dy}{dx} = 2 - y$

IV.  $\frac{dy}{dx} = x$

V.  $\frac{dy}{dx} = x - y$

VI.  $\frac{dy}{dx} = \sin x$

5. Find the particular solution  $y = f(x)$  to the given differential equations at the given initial condition.

a)  $\frac{dy}{dx} = \frac{x}{y}$ ,  $(1, -2)$

b)  $\frac{dy}{dx} = 2xy^2$ ,  $(0, \frac{1}{3})$

c)  $\frac{dy}{dx} = 3xy$ ,  $(0, 6)$

d)  $\frac{dy}{dx} = \sqrt{xy}$ ,  $(0, 4)$

e)  $\frac{dy}{dx} = (y - 7)$ ,  $(0, 0)$

f)  $\frac{dy}{dx} = \frac{x^2}{y}$ ,  $(1, 0)$