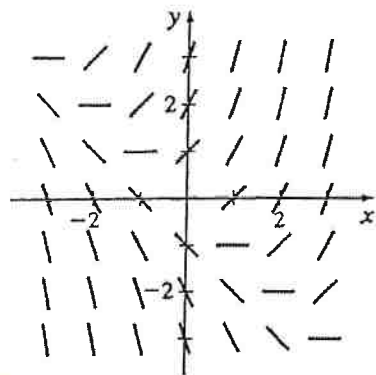


7.3 AP Practice and Exercise Problems (#17 and 18)

17. Which of the following differential equations could have the slope field shown below?

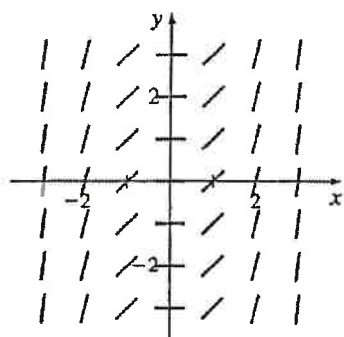


* ordered pairs (0,0), (1,-1) and (-1,1), and (2,-2) and (-2,2) all give slopes of 0

$$\frac{dy}{dx} = x + y$$

- (a) $\frac{dy}{dx} = -x$ (b) $\frac{dy}{dx} = x + y$ (c) $\frac{dy}{dx} = x$ (d) $\frac{dy}{dx} = x - y$

18. Which of the following differential equations could have the slope field shown below?

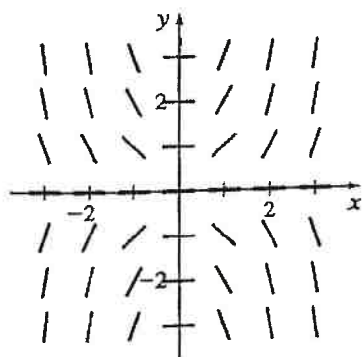


* All slopes are positive in all 4 quadrants

$$\frac{dy}{dx} = x^2$$

- (a) $\frac{dy}{dx} = -x$ (b) $\frac{dy}{dx} = x^2$ (c) $\frac{dy}{dx} = 2x + 1$ (d) $\frac{dy}{dx} = -x^2$

1. The slope field shown in the figure represents the solution to which differential equation?



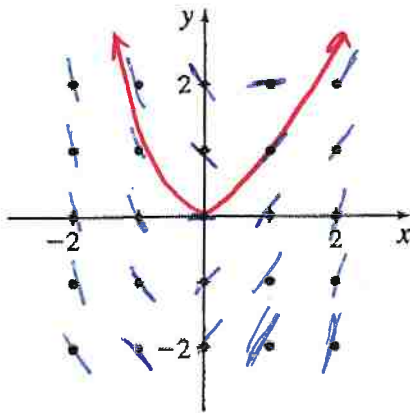
Q1: pos. slope
Q2: neg. slope
Q3: pos. slope
Q4: neg. slope

- (A) $\frac{dy}{dx} = x + y$ (B) $\frac{dy}{dx} = xy$
(C) $\frac{dy}{dx} = x - y$ (D) $\frac{dy}{dx} = \frac{x}{y}$

2. (a) Draw a slope field for the differential equation

$$\frac{dy}{dx} = 2x - y, \text{ using the grid below.}$$

(b) Use the slope field in (a) to draw the solution of the differential equation that satisfies the boundary condition $y = 0$ when $x = 0$.

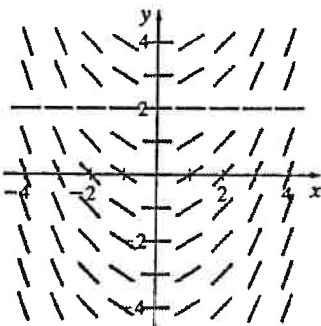


3. Which of the following represents the slope field of $\frac{dy}{dx} = x^2y - 4y$?

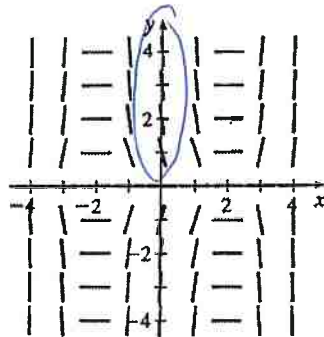
$$\frac{dy}{dx} = y(x^2 - 4)$$

* when $x=0$, $\frac{dy}{dx} > 0$ when $y > 0$

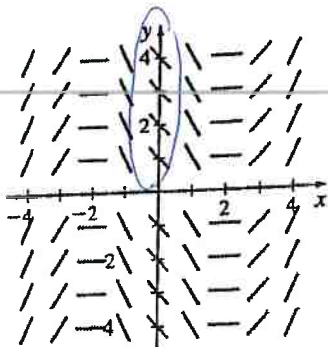
* As y increases, the slope becomes more negative



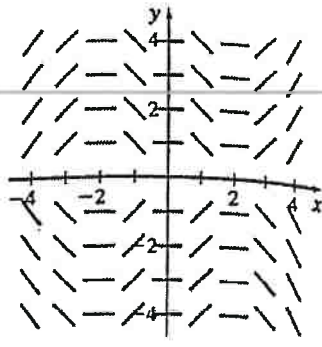
(A)



(B)



(C)



(D)