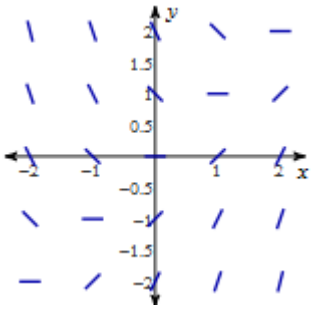
7.4 Reasoning Using Slope Fields

Calculus Name: _____ **CA #2**

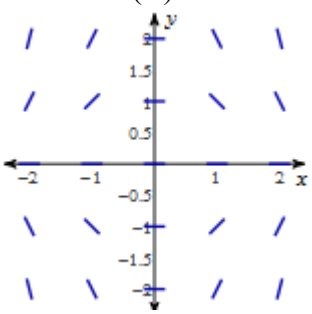
Match the slope field with the differential equation.

1. $\frac{dy}{dx} = xy$

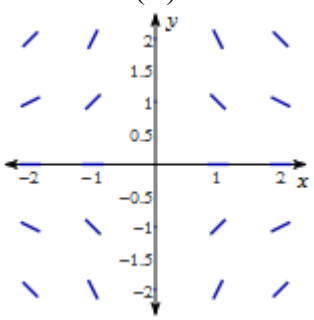
(A)



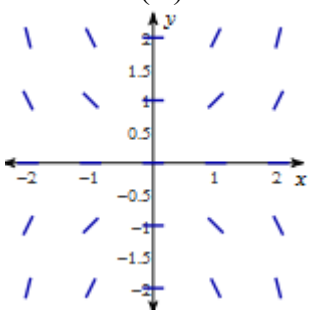
(B)



(C)



(D)



2.

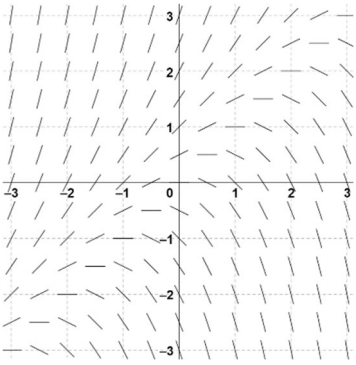
(A) $\frac{dy}{dx} = x - y$

(B) $\frac{dy}{dx} = x + y$

(C) $\frac{dy}{dx} = (x-1)(y-1)$

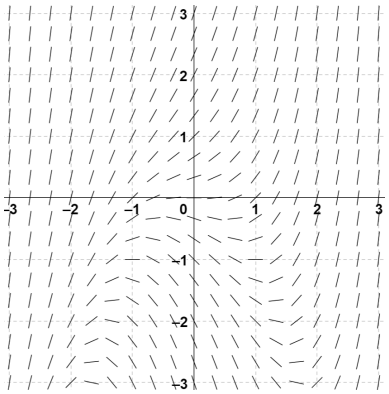
(D) $\frac{dy}{dx} = y - x$

(E) $\frac{dy}{dx} = xy^2$



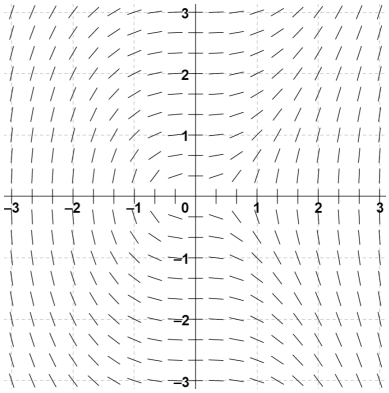
For each slope field, plot and label the points A and B and sketch the particular solution that passes through each of those points. (Two separate solutions for each slope field.)

3. $\frac{dy}{dx} = x^2 + y$



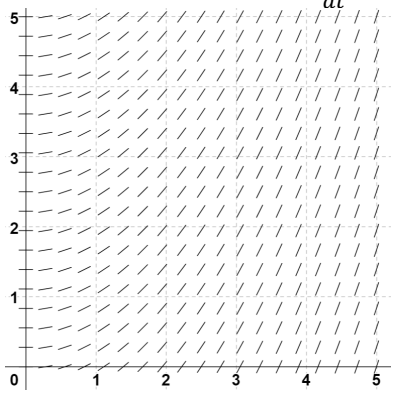
Point A: $(0, 2)$
Point B: $(0, -1)$

4. $\frac{dy}{dx} = \frac{x^2}{y}$

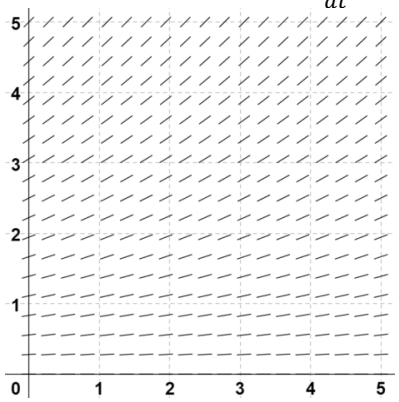


Point A: $(0, 1)$
Point B: $(0, -2)$

5. Explain why the following slope field cannot represent the differential equation $\frac{dy}{dt} = 0.6y$

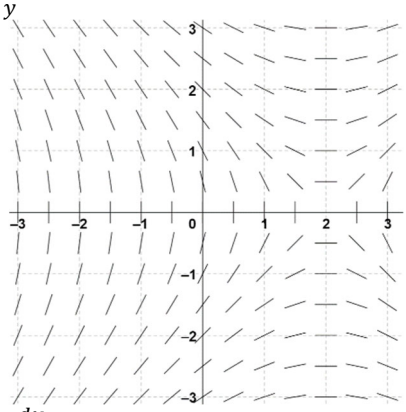


6. Explain why the following slope field cannot represent the differential equation $\frac{dy}{dt} = -0.2y$



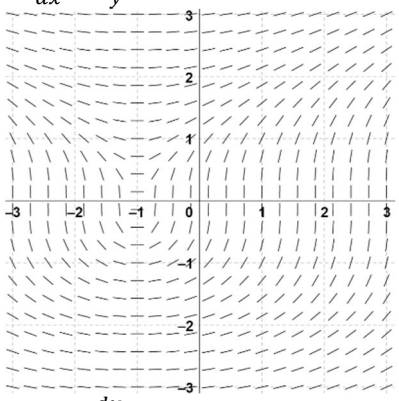
Consider the differential equation and its slope field. Describe all points in the xy-plane that match the given condition.

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



When does $\frac{dy}{dx} = 1$?

8. $\frac{dy}{dx} = \frac{x+1}{y^2}$

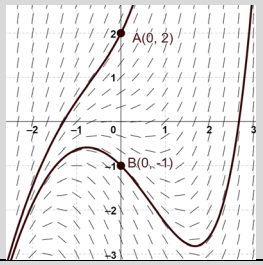


When is $\frac{dy}{dx}$ positive?

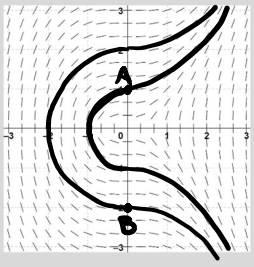
Answers to 7.4 CA #2

1. D
2. D

3.



4.



5. Possible answer: When $y = 0, \frac{dy}{dt} = 0$. However, in the slope field, the slopes of the line segments for $y = 0$ are nonzero.

6. $\frac{dy}{dx} < 0$ when $y > 0$, but the slope field shows line segments with positive slope.

7. All points that fall on the line $y = x - 2$

8. All points that where $x > -1$