**6.1 Notes and Examples**   Name: Block: Seat:

Slope Fields and Graphical Solutions to Differential Equations

1. (a) Finding an equation from its derivative is called "Solving a _____

    which informally we call a "_____

    (b) Later this chapter we will use _____ methods, but sometimes this approach, though precise, proves to be difficult or impossible.

    (c) In this section we will find a solution using graphical methods. Since we have an equation for the

    slope at any point, We draw short line segments with the correct _____ at various points.

    (d) Once we have a few of these, we call it a _____ or a

    _____

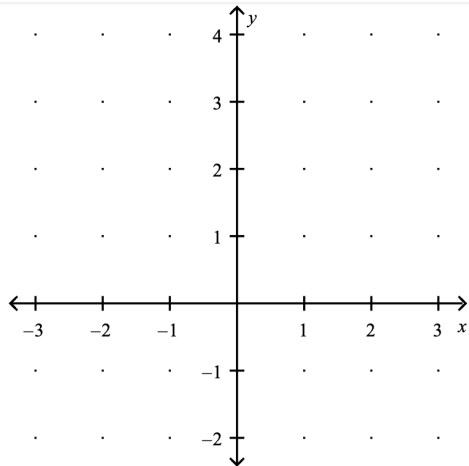2. Here are some slope fields. What kind of equations do they look like to you?
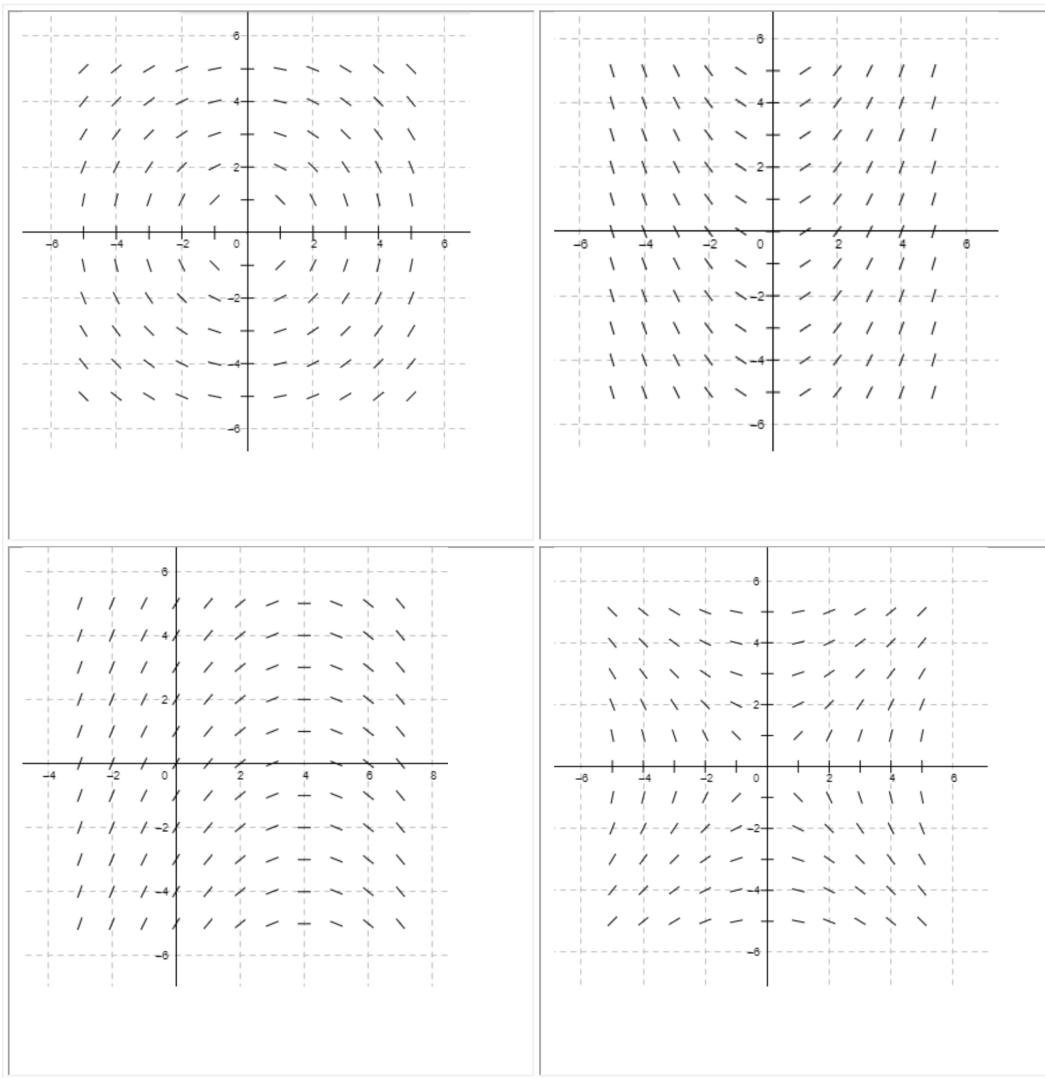
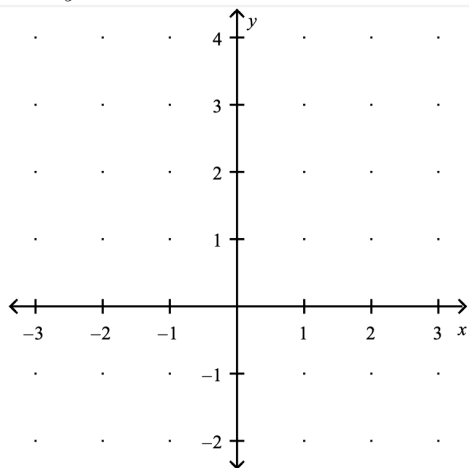3. Compute the slope at various points to sketch a slope field.

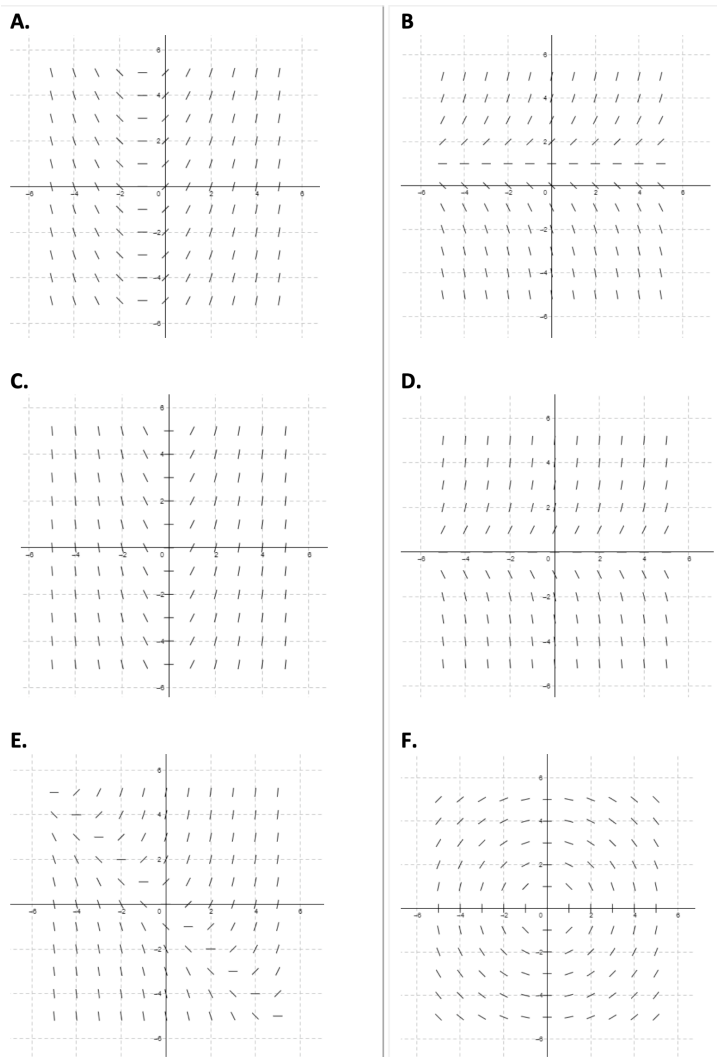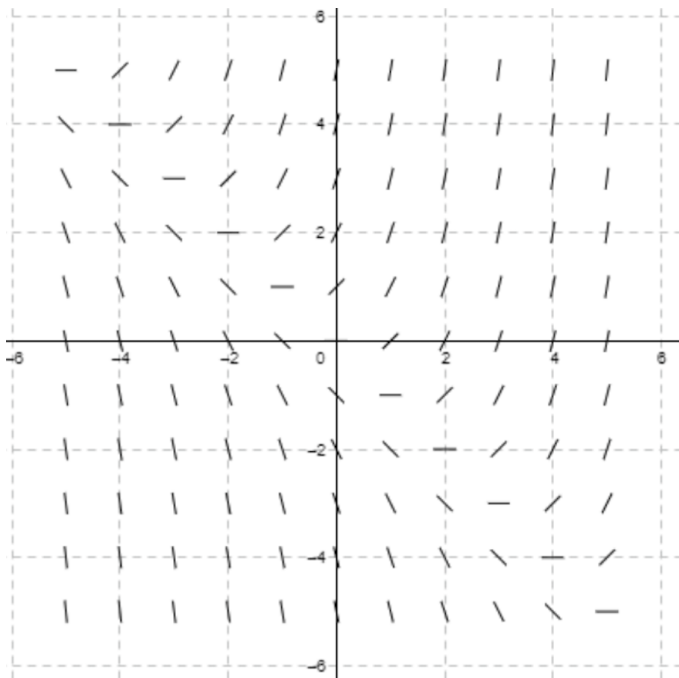(a) $\dfrac{dy}{dx} = x - 1$
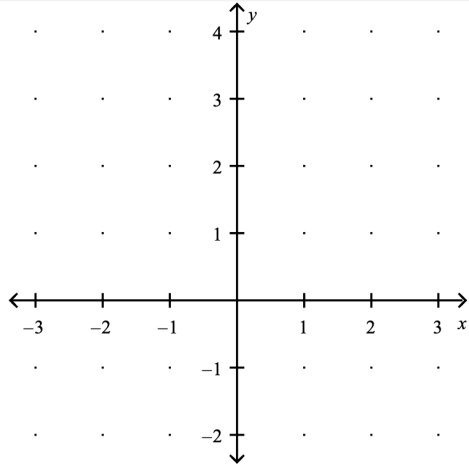
(b) $\dfrac{dy}{dx} = \dfrac{1}{2}y$

(c) $\dfrac{dy}{dx} = \dfrac{x}{y}$

4. Match the "diffEQ" with its slope field

(a) $\dfrac{dy}{dx} = 2y$

(b) $\dfrac{dy}{dx} = 2x$

(c) $\dfrac{dy}{dx} = x + 1$

(d) $\dfrac{dy}{dx} = y - 1$

(e) $\dfrac{dy}{dx} = x + y$

(f) $\dfrac{dy}{dx} = -\dfrac{x}{y}$

A.

B

C.

D.

E.

F.

5. Sketch a solution of the differential equation whose slope field is shown above that passes through the point $(-1, 1)$

6. Sketch a solution of the differential equation whose slope field is shown above that passes through the point $(3, 3)$

7. Sketch a solution of the differential equation whose slope field is shown above that passes through the point $(-1, -1)$

8. Show $y = 4e^{-6x^2}$ is a solution to the differential equation $\dfrac{dy}{dx} = -12xy$ that goes through $(0, 4)$

9. Delta Math Practice Slope fields `https://www.deltamath.com/`

10. 6.1 WS: Slope Fields `https://www.mathorama.com/gsp/Chapter%206.1%20WS.pdf`

11. Make your own Slope Field and find a particular solution with GeoGebra: `https://www.geogebra.org/m/Pd4Hn4BR`

12. Check your solutions at Desmos: `https://www.desmos.com/calculator/tmi3vk4r84`