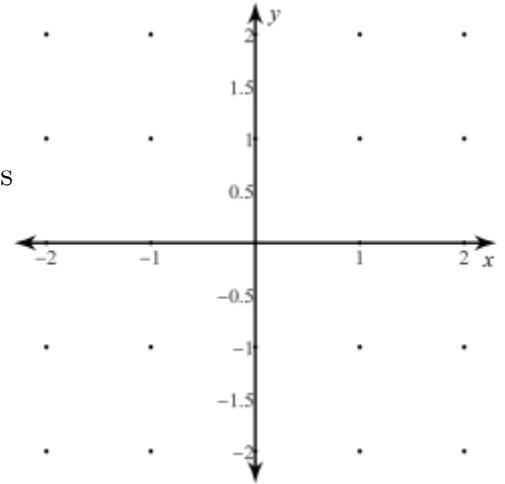


D-DE4

Q4 Practice Assessment #2

Consider the differential equation  $\frac{dy}{dx} = \frac{x}{y}$

1. On the axes provided, sketch a slope field at the points indicated (including the axes, where possible).
2. While only some points are graphed, the slope field for #1 is defined for many others. Describe all points in the  $xy$ -plane that have positive slope.



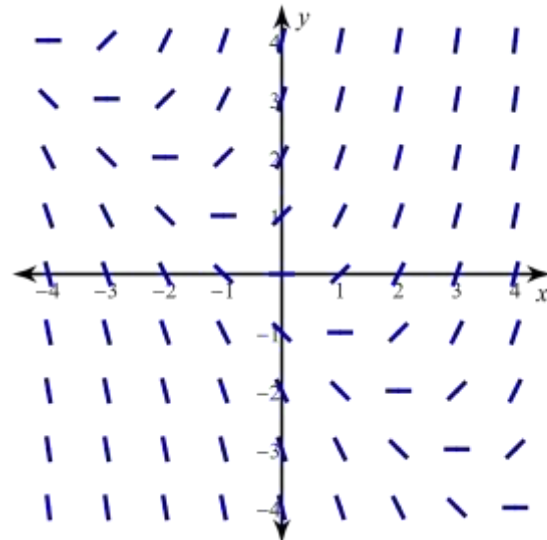
3. Choose the differential equation that could be represented by the given slope field.

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

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

$$\frac{dy}{dx} = -xy$$

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



D-DE1

4. An illness is spreading through a population of  $N$  people. Let  $R$  represent the number of people with the illness. The rate with respect to time of people with the illness is growing is directly proportional to the product of the number of people with the illness and the square root of the population size. Write a differential equation that models this situation.

D-DE3:

5. Consider the differential equation  $y' = 2y - 3$ . Find the general solution  $y$ .

D-DE2: Consider the differential equation  $\frac{dy}{dx} = 4y^2x$

6. Find the particular solution with initial condition  $(1, 1/3)$