

**Differential Equations and Slope Field Problem****Name:***AP Calculus*

Consider the differential equation  $\frac{dy}{dx} = \frac{x+1}{y}$ .

- (a) On the axes provided, sketch a slope field for the given differential equation at the twelve points indicated, and for  $-1 < x < 1$ , sketch the solution curve that passes through the point  $(0, -1)$ .

(Note: Use the axes provided in the exam booklet.)

- (b) While the slope field in part (a) is drawn at only twelve points, it is defined at every point in the  $xy$ -plane for which  $y \neq 0$ . Describe all points in the  $xy$ -plane,  $y \neq 0$ , for which  $\frac{dy}{dx} = -1$ .

- (c) Find the particular solution  $y = f(x)$  to the given differential equation with the initial condition  $f(0) = -2$ .

