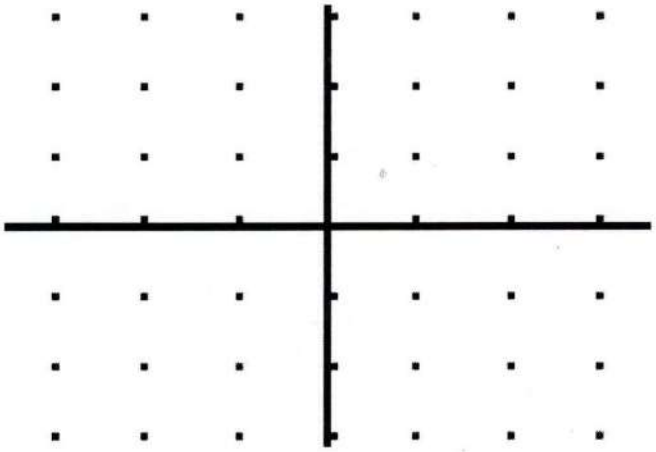
What is a slope field? **Name:**

AP Calculus

A slope field is a visual representation of the possible solutions to a differential equation. Remember that a solution to a differential equation is a *set* of functions or implicit functions or, if we have additional information, a *specific* function or implicit function. Instead of showing possible sketches of these functions, a slope field graphically illustrates the slope of the functions at specific points in the coordinate plane.

1) Let's create a slope field! Build the slope field for the differential equation: $\frac{dy}{dx} = \frac{-x}{y}$



What steps did you follow to create your slope field?

What does the slope field tell you about the functions (or implicit functions) that solve this differential equation?

Let's say that a solution to this differential equation goes through the point (6, 8). Sketch a solution to the differential equation that goes through this point.

2) Consider the differential equation $\frac{dy}{dx} = \frac{-xy^2}{2}$. Let $y = f(x)$ be the particular solution to this differential equation with the initial equation $f(-1) = 2$

On the axes provided below, sketch a slope field for the given differential equation at the twelve points indicated.

Then write an equation for the line tangent to the graph of f at x = -1