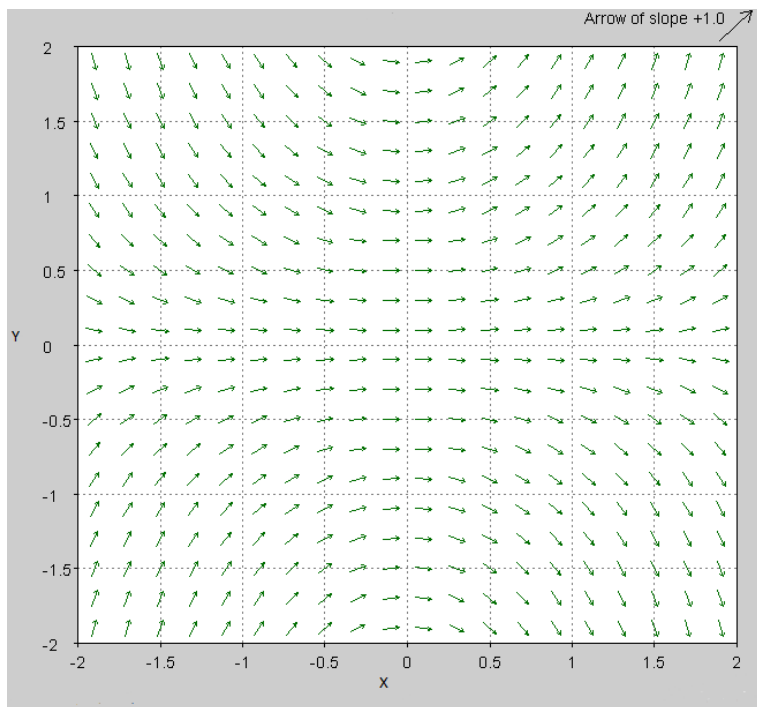


The following slope field diagram represents the differential equation  $\frac{dy}{dx} = xy$



Ia. Given the initial condition  $y(0) = .5$ , sketch a likely solution curve.

Ib. Using the same initial condition, come up with an exact formula for the solution curve.

II. Carbon 14 has a half-life of 5700 years (recall that a half-life is the amount of time it takes 1 gram of Carbon 14 to decay into 0.5 grams.). A sample of a dead tree is taken, and it contains 5.64 grams of Carbon 14. A similarly sized tree sample would be expected to contain 10 grams of Carbon 14 when it died. How old is the tree?