

Math 2250-4
Mon Jan 14
We will primarily use Friday's notes.

Intro to Maple sessions in LCB 115, this week:

M 12:55-1:45 p.m. N. Korevaar

T 11:50 a.m.-12:40 p.m. TBA

2:00-2:50 p.m. G. Gustafson

W 11:50 a.m.-12:40 p.m. TBA

3:05-3:55 p.m. C. Brooks

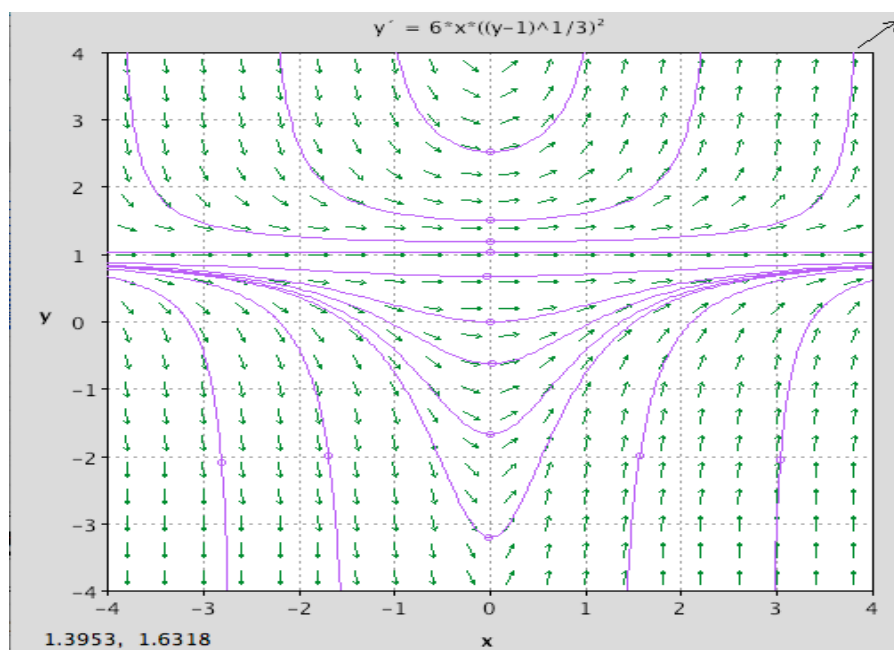
F 8:35 a.m.-9:45 a.m. L. Zinn-Bjorkman

If you choose to buy a copy of Maple for your personal computer, you can use the bookstore or purchase on-line.

Exercise 1: Here's another example of using a separable DE to illustrate the existence-uniqueness theorem. Consider the solution(s) to the IVP for the DE:

$$y' = 6x(y-1)^{\frac{2}{3}}$$
$$y(x_0) = y_0$$

Are your answers consistent with the slope field and solution trajectories sketched below?



Exercise 2) And if we have time, a final example related to this week's (and last week's homework): In homework problem 1.1.29 last week you were asked to express the following conditions as a differential equation for the solution function: *Every straight line normal to the graph of $y = g(x)$ passes through the point $(0, 1)$.*

Let us instead require that the normal lines pass through the origin $(0, 0)$. And let's add the condition that the point $(0, 3)$ lie on the graph.

a) Derive the IVP for the solution function above

$$\frac{dy}{dx} = -\frac{x}{y}$$
$$y(0) = 3.$$

b) Find the solution function.

c) Interpret in terms of the existence-uniqueness theorem.

