Assignment2:

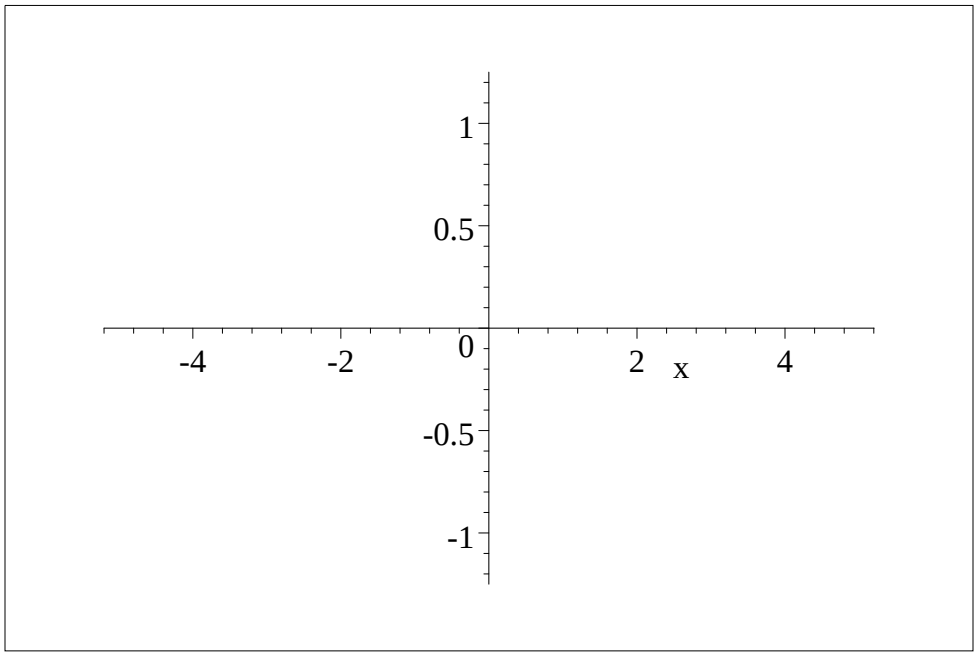
1. Write the solution of the initial value problem

$$\frac{dy}{dt} = \frac{t}{y(1+t^2)}, \quad y(0) = 5$$

2. Use $\frac{dy}{dt} = y + \sin y$ to fill the following table

Point	$\frac{dy}{dt}$ **two digits after the decimal sign is enough**
$(0,-1)$	
$(0,-.8)$	
$(0,-.6)$	
$(0,-.4)$	
$(0,-.2)$	

and use this to sketch a slope field for this differential equation



3.

Use $\Delta t = 0.5$ to apply the Euler's method for approximating the solution to the initial value problem from $t = 1$ to $t = 3$

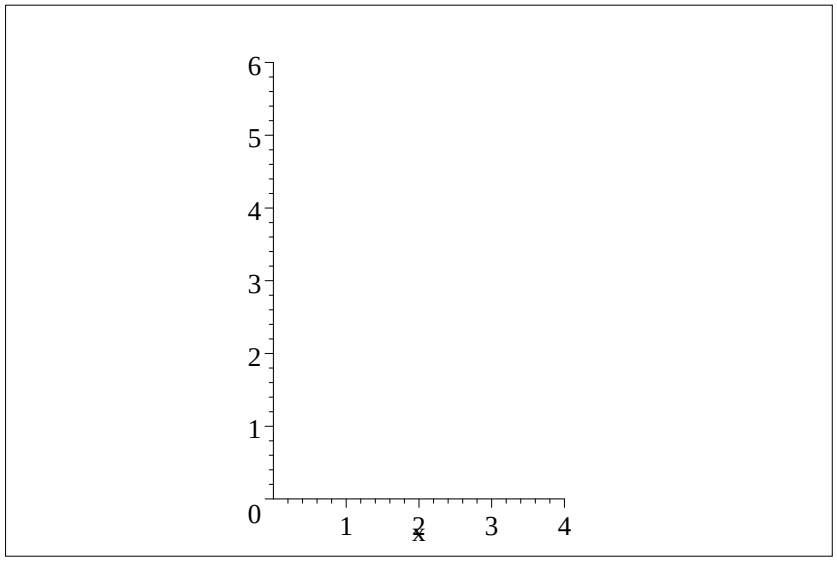
$$\frac{dy}{dt} = e^{2/y},\ y(1) = 2$$

a)

Fill in the following table

k	t_k	y_k	$f(t_k,y_k)$
1			
2			
3			
4			

b)
Make a sketch of the approximate solution



4.

a) Find a formula for the solution of the differential equation $\frac{dy}{dt} = \frac{1}{(y+2)^2}, y(0) = 1$

b) State the domain of the definition of the solution.

c) Describe what happens when the solution approaches the limits of its domain of definition.