2022 Differential Equation Quiz 5

Q1 :Find the solution of the initial value problem

y" -y = 0 , y(0) = $\frac{5}{4}$, y'(0) = -$\frac{3}{4}$

plot the solution for 0≤t≤2 and determine the minimum value

-Hint : solve the ODE first and put the range of time to check the minimum value

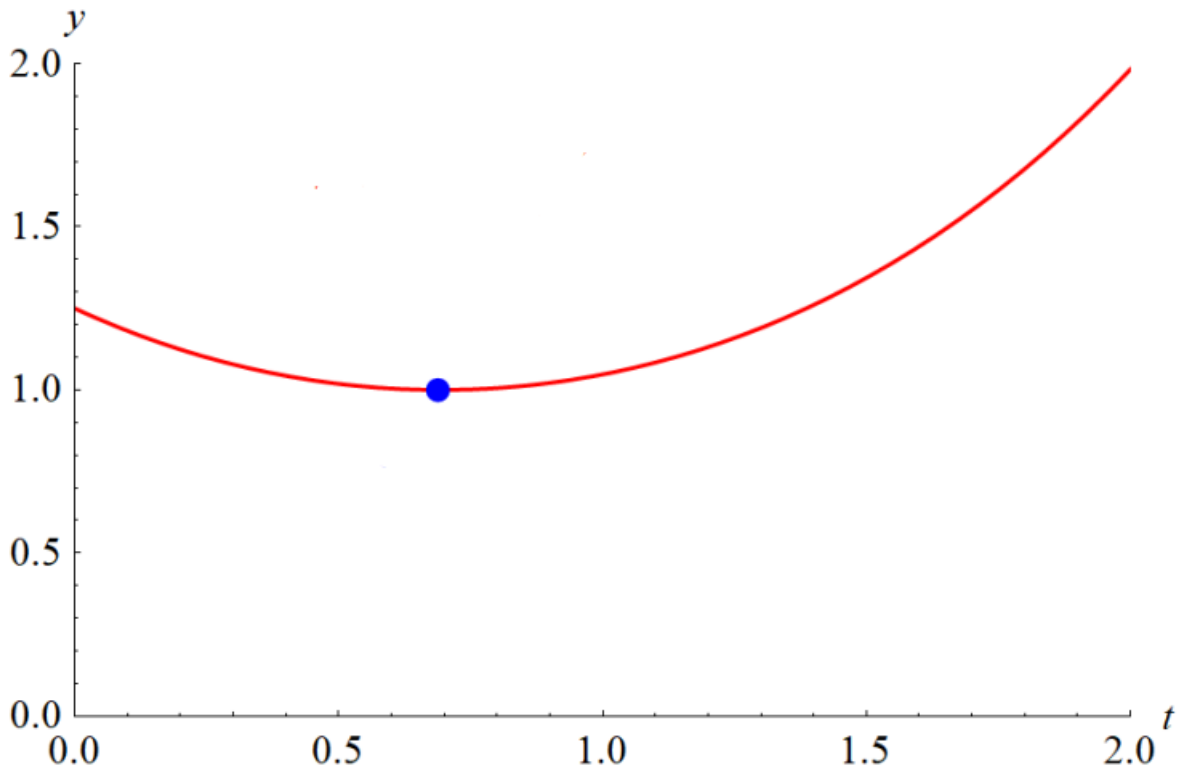

Fig. 1: Example plot

Q2. Consider the initial value problem

2y"+3y'-2y=0, y(0)=1,y'(0)=-β

a) Solve initial problem

b) Plot the solution when β=1. Find coordinates (y_0, t_0) of the minimum point of the solution in this case

c) Find the smallest value of for which the solution has no minimum point.