

Q1.  $y = \frac{1}{3-2x}$  is the solution curve satisfying  $\frac{dy}{dx} = 3y^2$ . Plot this solution curve and give the interval over which the solution curve can be plotted.

Q2. Find a function  $y(x)$  that satisfies the initial value problem  $\frac{dy}{dx} = \frac{1}{\sqrt{3x+2}}$ ;  $y(1) = 2$ .

Q3. A city had a population of 25000 in 1970 and a population of 50000 in the year 1980. Assume that its population growth satisfies  $\frac{dP}{dt} = kP$ . Find population of this city in the year 2010.