

For the given differential equation, answer the following questions

a) For which values  $a$  and  $b$  does Theorem 1 guarantee existence of a unique solution with initial value  $y(a) = b$ ?

b) Graph all solution curves satisfying the initial condition  $y(0) = 1$ .

c) Graph all solution curves satisfying the initial condition  $y(1) = 0$ .

1.  $yy' = x - 1$

2.  $y' = 2\frac{y}{x}$

3.  $y' = y^2$