QUIZ 1

(1) Consider the differential equation
$$\frac{dy}{dt} = 0.5y - 20.$$
(a) Find the equilibrium solution.
$$y = 40$$
(b) Find the general solution.
$$y = 40 + Ce^{0.5t}.$$
(c) Assume the initial value is $y(0) = a$. Find the particular solution of the equation.
$$y = 40 + (a - 40)e^{0.5t}$$
(d) Assume the initial value is $y(0) = a$. Find the range of a such that
$$\lim_{t \to +\infty} y(t) = +\infty$$

It is necessary that $a - 40 > 0$ or that $a > 40$.