Question::

Let P (t) represent a population of farm-raised catfish in a small lake at any

time t in days.

(a) If the population grows according to the Malthusian model, and the time for the

catfish population to triple if it grows by 10% in 45 days. Show all of you work.

Your answer should be exact (it will contain logarithms)

(b) Suppose instead that the population grows logistically with r = 0:1 and a carrying

capacity of 1500 catfish. Write the deferential equation modeling the change in the

catfish population with respect to time.

(c) Edit your model from part a) to obtain a differential equation modeling the change

in the catfish population with respect to time if catfish are harvested (removed)

at a rate of X% of the present population per day where 0 < X < 100: (Hint X% =x/100

(d) Using that the differential equation from part b) is still logistic, determine the value

of X for which in the long run, a level of 900 catfish can be sustained in the farm's

lake.