MATH 100   ASSIGNMENT #7   Name: _____ Section:____
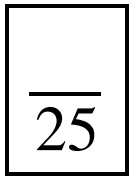
First work through the recommended practice problems listed in the following table from the 11th edition of *Calculus of a Single Variable* by Larson and Edwards. You do not need to hand these in. Once you have completed these, then do the small sampling of questions below. Write full solutions (not just the final answer) in the space provided.

$$\overline{25}$$

6.2 Growth and Decay	5, 9, 11, 13, 17, 19, 21, 29, 37, 53, 57, 65
6.3 Separation of Variables and the Logistic Equation	9, 11, 13, 19, 21, 23, 25

Sec 6.2 #10: Solve the differential equation $y' = x(1+y)$.

Sec 6.2 #14: Write and solve the differential equation that models the verbal statement: "The rate of change of P with respect to t is proportional to $25 - t$."

Sec 6.2 #22: The rate of change of P is proportional to P. When $t = 0$, $P = 5000$, and when $t = 1$, $P = 4750$. What is the value of P when $t = 5$?

Sec 6.2 #56: **Bacteria Growth:** The number of bacteria in a culture is increasing according to the law of exponential growth. There are 125 bacteria in the culture after 2 hours and 350 bacteria after 4 hours.

   (a) Find the initial population.

(b) Write an exponential growth model for the bacteria population. Let t represent time in hours.

(c) Use the model to determine the number of bacteria after 8 hours.

(d) After how many hours will the bacteria count be 25,000?

Sec 6.3 #12: Find the general solution of the differential equation $xy' = y$.

Sec 6.3 #26: Find the particular solution of the differential equation $\dfrac{dr}{ds} = e^{r-2s}$ that satisfies the initial condition $r(0) = 0$.