1) Consider the initial simplex tableau:

\[
\begin{array}{cccccc}
 x_1 & x_2 & s_1 & s_2 & Z \\
 s_1 & [-1 & 2 & 1 & 0 & 0 | 8] \\
 s_2 & 10 & 6 & 0 & 1 & 0 | 12 \\
 Z & -3 & -8 & 0 & 0 & 1 | 0 \\
\end{array}
\]

a) Complete the optimization problem for which the tableau is written

Maximize \[ Z = \]

subject to

\[ x_1, x_2 \geq 0 \]

b) What is the entering variable?

c) What is the departing variable?

d) Find the maximum value of \( Z \).
2) An investment grows from $5500 to $6105 in one year. If the investment continues to grow at that rate, find the number of years it will take for the initial investment to triple. (3 points)

3) You have a choice of two banks. One bank pays interest at 5.5 % compounded monthly and the other bank pays interest at 5.4 % compounded daily (365 times a year). Which is the better choice? Justify your answer. (2 points)

4) How many distinguishable horizontal arrangements of all the letters in BOOKS are possible? (2 points)
5) A debt of $12,000, which is due 10 years from now, is instead to be paid off by four payments: $3000 now, $2000 in 3 years, $2000 in 6 years, and a final payment at the end of 8 years. What would this payment be if an interest rate of 6% compounded semiannually is assumed? (3 points)

6) If $200 is deposited into a savings account that earns interest at an annual rate of 8% compounded continuously, find the value of the account at the end of two years. (2 points)

7) A company will hire five people: three for the assembly department and two for the finishing department. There are eight applicants who are equally qualified to work in each department. In how many ways can the company fill the positions? (2 points)
8) A person establishes the following retirement plan: an immediate deposit of $10,000 and quarterly payments of $1,500 at the end of each quarter into a savings account that earns 5% compounded quarterly, what is the amount of the investment after 21 years? (3 points)

9) Suppose an annuity due consists of 6 yearly payments of $200 and the interest rate is 5% compounded annually. Determine the present value of the annuity. (2 points)

10) A manufacturer places a four-symbol code on each unit of a product. The first three symbols are numbers with the first not 0, and the fourth symbol is a letter other than o. How many codes are possible? (2 points)