A QUIZ

Problem 1
Bob makes a one-time deposit of $1,000 in a savings account with an interest rate of 10% per year. Interest is compounded and accrued daily. How many days will it take for the account value to exceed $1,200?

Problem 2
Consider a set of 100 widgets, of which 25 are defective and 75 are OK. If 5 widgets are selected randomly from this set, what is the probability of obtaining exactly 2 defective widgets?

Problem 3
If Q denotes quantity and P denotes price, demand for a certain monopolist's product is given by $Q = 100 - P$, while the monopolist's cost is given by $750 + 8Q$. What price must the monopolist charge in order to maximize her profit?

Problem 4
Acme Widgets Inc. has two factories, *A* and *B*. Factory *A* contributes 20% of Acme's annual output of widgets, while Factory *B* contributes 80%. Of the widgets produced by Factory *A*, roughly 4% are defective and 96% are non-defective. Of the widgets produced by Factory *B*, only 1% are defective. If a widget is selected at random from the Acme's annual output and is found to be defective, what is the likelihood that it was produced by Factory *A*?

Problem 5
Suppose the price of a stock increases by 40% in Year 1, by 1% in Year 2 and by 10% in Year 3. What is the constant annual percentage increase that would have effectively produced the same price at the end of three years?

Problem 6
Suppose $Q = R^{-0.8U} S^{0.4V} T^{2.6W}$. Paying special attention to *curvature*, sketch a "rough" graph of:

- Q against R (for $R > 0$) when $S = T = U = V = W = 1$
- Q against S (for $S > 0$) when $R = T = U = V = W = 1$
- Q against T (for $T > 0$) when $R = S = U = V = W = 1$
- Q against U when $R = 2$ and $S = T = V = W = 1$
- Q against V when $S = 2$ and $R = T = U = W = 1$
- Q against W when $T = 2$ and $R = S = U = V = 1$.

The absolute numerical values are not important. The *shape* and *curvature* is important. Identify each graph as either *concave* or *convex*.