Quiz 6

Question 1. *(5 marks)* Camille purchased a 15-yr franchise for a computer outlet store that is expected to generate income at the rate of $R(t) = 400000$ dollars/year. If the prevailing interest rate is 8%/year compounded continuously, find the present value of the franchise.

$$PV = \int_0^T R(t)e^{-rt}\,dt = \int_0^{15} 400000\, e^{-0.08t}\,dt = 400000 \int_0^{15} e^{-0.08t}\,dt$$

$$= 400000\left[\frac{e^{-0.08t}}{-0.08}\right]_0^{15} = 5000000\left[-e^{-1.2} + e^{0}\right]$$

$$= \$3\,494\,028.94$$

Question 2. *(5 marks)* A state lottery commission pays the winner of the "Million Dollar" lottery 20 annual installments of \$50 000 each. If the prevailing interest rate of 6%/year compounded continuously, FIND THE PRESENT VALUE OF THE WINNING TICKET.

$$PV = \frac{mP}{r}\left(1 - e^{-rT}\right) = \frac{(1)(50\,000)}{0.06}\left(1 - e^{-0.06(20)}\right)$$

$$= \$582\,338.16$$