Problem 1.1. (10 points) Source: Problem 18.6 in McDonald.
Let $X \sim N(2, 5)$.
   (i) (2 points) Find $E[e^X]$.
   (ii) (3 points) Find the median of $e^X$.

Problem 1.2. (5 points)
The current stock price is given to be $S(0) = 30$. The stock has the rate of appreciation 0.12 and volatility 0.3.
Let $a$ denote the probability that the stock price in three months is less than $32$, i.e., set $a = P[S(1/4) < 32]$.
Then,
   (a) $0 \leq a < 0.35$
   (b) $0.35 \leq a < 0.45$
   (c) $0.45 \leq a < 0.50$
   (d) $0.50 \leq a < 0.64$
   (e) None of the above.

Problem 1.3. (5 pts)
A non-dividend-paying stock is currently valued at $100$ per share. Its annual mean rate of return is given to be 12% while its volatility is given to be 30%.
Assuming the lognormal stock-price model, find
$E[S(2) | S(2) > 95]$.
   (a) $86.55$
   (b) $101.60$
   (c) $152.35$
   (d) $159.07$
   (e) None of the above.