68. Solution: C
Note that X has an exponential distribution. Therefore, \( c = 0.004 \). Now let Y denote the claim benefits paid. Then \( Y = \begin{cases} x & \text{for } x < 250 \\ 250 & \text{for } x \geq 250 \end{cases} \) and we want to find m such that 0.50 = 0.004m

\[
\int_0^m 0.004e^{-0.004x} \, dx = -e^{-0.004x} \bigg|_0^m = 1 - e^{-0.004m}
\]

This condition implies \( e^{-0.004m} = 0.5 \Rightarrow m = 250 \ln 2 = 173.29 \).

69. Solution: D
The distribution function of an exponential random variable \( T \) with parameter \( \theta \) is given by \( F(t) = 1 - e^{-t/\theta}, \ t > 0 \)

Since we are told that \( T \) has a median of four hours, we may determine \( \theta \) as follows:

\[
\frac{1}{2} = F(4) = 1 - e^{-4/\theta} \\
\frac{1}{2} = e^{-4/\theta} \\
-\ln(2) = -\frac{4}{\theta} \\
\theta = \frac{4}{\ln(2)}
\]

Therefore, \( \Pr(T \geq 5) = 1 - F(5) = e^{-5/\theta} = e^{-\frac{5\ln(2)}{4}} = 2^{-\frac{5}{4}} = 0.42 \)

70. Solution: E
Let X denote actual losses incurred. We are given that X follows an exponential distribution with mean 300, and we are asked to find the 95th percentile of all claims that exceed 100. Consequently, we want to find \( p_{95} \) such that

\[
0.95 = \frac{\Pr[100 < X < p_{95}]}{P[X > 100]} = \frac{F(p_{95}) - F(100)}{1 - F(100)} \text{ where } F(x) \text{ is the distribution function of } X.
\]

Now \( F(x) = 1 - e^{-x/300} \).

Therefore, \( 0.95 = \frac{1 - e^{-p_{95}/300} - (1 - e^{-100/300})}{1 - (1 - e^{-100/300})} = \frac{e^{-1/3} - e^{-p_{95}/300}}{e^{-1/3}} = 1 - e^{1/3} e^{-p_{95}/300} \)

\[
e^{-p_{95}/300} = 0.05 e^{-1/3}
\]

\[p_{95} = -300 \ln(0.05 e^{-1/3}) = 999\]