1. A Porsche GT3 Cup car’s engine has a mean time between failures of 250 hours, where the failure rate is constant. Suppose that a certain race requires failure-free operation of the engine for 20 hours. What is the probability that the engine will complete the race without failure? Please round your answer to 2 decimals.
2. The hazard function of a product is given by λ = λt where λ > 0. Suppose we subject the product to the burn-in period T0. Will the conditional reliability R (t|T0 ) increase or decrease as the burn-in period T0 increase?
3. The failure distribution is given by the function below. What is the MTTF (in hours).

$$f\left(t\right)=\left(\frac{3t²}{10⁹}\right)^{}, for 0 \leq t\leq 1000hr$$



1. The time to failure of a typical household refrigerator has the following pdf: What is the reliability of the refrigerator for the first year? Please round your answer to 2 decimals

$$f\left(t\right)= \left\{\begin{array}{c}0.003t^{2}-0.06t+0.3 for 0\leq t\leq 10 years\\0 elsewhere\end{array}\right.$$



1. Pick three contributing factors for observing an IFR hazard.

Hint: These factors can typically be addressed using preventative maintenance.

