Example using Hazard Rate

Kinney Prob 3.4.12 (p.203)

Find the probability that an item fails before 200 units of time if its hazard rate is 0.008.

We are looking for P(failure before 200 units of time)

$$= P(\text{Lifetime} < 200)$$

$$= P(X < 200)$$

$\quad\uparrow$ where X is some RV that measures the item's lifetime

- The only type of hazard rate we know how to work with is a <u>constant</u> hazard rate, and constant hazard rates mean we are working with the exponential dist.

so we are looking for

$$P(X < 200) = F(200) = 1 - e^{-\lambda 200}$$

Now, all we need is λ, and λ = the hazard rate = 0.008

$$P(X < 200) = F(200) = 1 - e^{-0.008 \cdot 200} = \underline{0.7981}$$

(I have no idea why the book marked this as a computer problem)