

Quiz II Solution (oops I did the questions backwards...)

$$f(t) = \frac{4.045}{t^{1.532}} \quad t \text{ in } [16, 80]$$

$$\begin{aligned} \text{(b)} \quad E(X) &= \int_{16}^{80} t f(t) dt \\ &= \int_{16}^{80} 4.045 t^{-0.532} dt \\ &= \frac{4.045 t^{0.468}}{0.468} \Big|_{16}^{80} \\ &= \frac{4.045}{0.468} (80^{0.468} - 16^{0.468}) \\ &= 35.554 \text{ y/a.} \end{aligned}$$

$$\begin{aligned} \text{(a)} \quad P(16 \leq t \leq 30) &= \int_{16}^{30} 4.045 t^{-1.532} dt \\ &= \frac{4.045 t^{-0.532}}{-0.532} \Big|_{16}^{30} \\ &= \frac{4.045}{-0.532} (30^{-0.532} - 16^{-0.532}) \\ &= 0.494. \end{aligned}$$