Let X denote the lifetime, then

$$X \sim Exp\left(\frac{1}{10000}\right)$$

$$F(x) = P(X \le x) = 1 - e^{-\frac{1}{10000}x}$$

(a)

$$P(X \le 20000) = 1 - e^{-2}$$

(b)

$$P(X > 8000) = 1 - F(8000)$$

$$= e^{-\frac{4}{5}}$$

(c)

$$p(X > 20000 \mid X > 8000)$$

$$= \frac{p(X > 20000)}{p(X > 8000)}$$

$$= \frac{e^{-2}}{e^{-\frac{4}{5}}} = e^{-\frac{6}{5}}$$