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✗ You are given:

(i) $\mu_{x(t)} = 0.03,\ t \geq 0$

(ii) $\delta = 0.05$

(iii) $T(x)$ is the future lifetime random variable.

(iv) g is the standard deviation of $\bar{a}_{\overline{T(x)}|}$

Calculate $P(\bar{a}_{\overline{T(x)}|} > \bar{a}_x - g)$

(A) 0.53 (B) 0.56 (C) 0.63 (D) 0.68 (E) 0.79

We have that $\bar{a}_{\overline{T_x}|} = \dfrac{1 - e^{-\delta(T_x)}}{\delta}$

$$\bar{A}_x = \frac{\mu}{\mu + \delta} = \frac{0.03}{0.05 + 0.03} = \frac{3}{8}$$

$$^2\bar{A}_x = \frac{\mu}{\mu + 2\delta} = \frac{0.03}{0.03 + 2(0.05)} = \frac{3}{13}$$

$$\bar{a}_x = \frac{1 - \bar{A}_x}{\delta} = 12.5$$

$$Var(\bar{a}_{\overline{T_x}|}) = \frac{1}{\delta^2}\left({}^2A_x - A_x^2\right)$$

$$= 36.1$$

$$\therefore P(\bar{a}_{\overline{T_x}|} \geq \bar{a} - \sigma) = \left(\frac{1 - e^{-0.05T_x}}{0.05} \geq 12.5 - \sqrt{36.1}\right) =$$

$$P(T_x \geq -20\ln(0.57524)) = 0.79009$$