

278-282. Use the following information for questions 278-282.

A 30-year term insurance on Janet age 30 and Andre age 40 provides the following benefits:

- A death benefit of 140,000 if Janet dies before Andre and within 30 years.
- A death benefit of 180,000 if Andre dies before Janet and within 30 years.

You are given:

- (i) Mortality for both Janet and Andre follows $l_x = 100 - x$, $0 \leq x \leq 100$.
- (ii) Their future lifetimes are independent.
- (iii) $i = 0$
- (iv) The death benefit is payable at the moment of the first death.
- (v) Premiums are payable continuously at rate P while both are alive, for a maximum of 20 years.

278. Calculate the probability that at least one of Janet and Andre will die within 10 years.

- (A) $1/42$
- (B) $1/12$
- (C) $1/7$
- (D) $2/7$
- (E) $13/42$

279. Calculate ${}_{10}q_{30:40}^2$.

- (A) 0.012
- (B) 0.024
- (C) 0.042
- (D) 0.131
- (E) 0.155

280. Calculate the probability that the second death occurs between times 10 and 20.

(A) 0.071

(B) 0.095

(C) 0.293

(D) 0.333

(E) 0.357