Please return this page with your signature. Please write your name and student number at the spaces provided:

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An insurance company sells one-year term insurance policies to n policyholders, all with independent future lifetimes. Each policyholder is age x and pays \$20 now to receive the coverage.

- The death benefit of \$1,000 is payable at the end of the first year, if death occurs during the first year.

- $i = 5\%$

- $q_x = 0.01$

- The 95th percentile of the standard normal distribution is 1.645.

- The 99th percentile of the standard normal distribution is 2.326.

Based on the normal approximation, calculate the smallest n such that the total payments received now from all policyholders will be sufficient to pay present value of all claims:

(a) with probability of at least 0.95;

(b) with probability of at least 0.99; and

(c) Intuitively explain why one is larger than the other.