

Question #15987 the scores of students in a statistics test is known to be normally distributed with mean 60% and variance 16. Compute the proportion of students who scored: (a) more than 60%. (b) below 58%. (c) between 56% and 60%. (e) if 10% of the students got distinction, what is the maximum mark of distinction?

Solution. Denote by ξ the score of students, then $\xi \sim N(60, 16)$.

a) $P(\xi > 60) = 0.5$.

b) $P(\xi < 58) = P\left(\frac{\xi - 60}{4} < -0.5\right) = \Phi(-0.5) \approx 0.3$.

c) $P(56 < \xi < 60) = P\left(-1 < \frac{\xi - 60}{4} < 0\right) \approx 0.5 - 0.15 = 0.35$

e) we are to find x , such that $P(\xi > m) = 0.1$ or $P\left(\frac{\xi - 60}{4} > \frac{m - 60}{4}\right) = 0.1$, thus $m = 4Q_N(0.9) + 60 = 4 \cdot 1.28 + 60 = 65.12$