

Problems of Probability using Gauss' normal distribution

- 1) The random variable x follows a normal distribution $N(420, 13)$. Calculate:
 - a) Probability that x takes a value below 423.
 - b) Probability that the variable takes a value above 446.
 - c) Probability that x takes a value between 423 and 446.

- 2) If the random variable x follows a normal distribution $N(855, 18)$, find out:
 - a) Probability that the variable takes a value exceeding 891.
 - b) Value of x that has a lower probability of 75%.

- 3) The random variable x follows a normal distribution with a mean of 220 and a standard deviation of 12. Calculate:
 - a) Probability that x takes a value below 230.
 - b) Value of x that has an upper probability of 71%.

- 4) In a farming region the weight of the nectarines follows a normal distribution with a mean of 92 g and a standard deviation of 30 g. We select at random a fruit. Calculate:
 - a) Probability that the weight takes a value exceeding 116 g.
 - b) Probability that the weight takes a value between 99 g and 116 g.

- 5) We know that the microwave ovens of a manufacturer has a life (in months) that follows the normal distribution $N(76, 20)$. We study a random sample of 196 microwave ovens. Find out:
 - a) Probability that the average life of the sample takes a value exceeding 78 months.
 - b) Probability that the average life of the sample takes a value between 76 and 78 months.

- 6) In a farming region the weight of the nectarines follows the normal distribution $N(195, 25)$. We study a random sample of 9 nectarines. Find out:
 - a) Probability that the average weight of the sample takes a value exceeding 204 g.
 - b) Probability that the average weight of the sample takes a value between 192 g and 204 g.

Answers:

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|----|-----------|-----------|----------|
| 1) | a) 59.13% | b) 2.28% | c) 38.6% |
| 2) | a) 2.28% | b) 867.14 | |
| 3) | a) 79.77% | b) 213.36 | |
| 4) | a) 21.19% | b) 19.59% | |
| 5) | a) 8.08% | b) 41.92% | |
| 6) | a) 14.01% | b) 50.05% | |