

Math 373 Hw 9 Recommended problems, don't turn this in.

225: 6.34abc, 6.40, 6.44. 240: 7.2, 7.4. Rec 225: 6.33, 6.35, 6.43. 240: 7.3, 7.5, 7.7.

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6.31 Let x be a binomial random variable with $n=25$ and $p=.3$.

- (a) Is the normal approximation appropriate for x ?
- (b) Find the mean and std. dev. for x .
- (c) Use the normal approximation to find $P(6 \leq x \leq 9)$.
- (d) Use Table 1 in Appendix I to find the exact probability $P(6 \leq x \leq 9)$.

6.33 Let x be a binomial random variable with $n = 100$ and $p = .2$. Find approximations to these probabilities.

- (a) $P(x > 22)$
- (b) $P(x \geq 22)$
- (c) $P(20 < x < 25)$
- (d) $P(x \leq 25)$

6.40 Data collected over a long period of time show that a particular genetic defect occurs in one out of every 1000 children. The records of a medial clinic show $x = 60$ children with the defect in a total of 50,000 examined. If the 50,000 children were a random sample from the population of children represented by past records, what is the probability of observing a value x equal to 60 or more?

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7.3 A population contains 50,000 voters. Use the random number table to identify the voters to be included in a random sample of $n = 10$.

7.5 A random sample of public opinion in a small town was obtained by selecting every tenth person who passed by the busiest corner in the downtown area. Will this sample have the characteristics of a random sample selected from the town's citizens?

7.7 In many states, lists of possible jurors are assembled from voter registration lists and Department of Motor Vehicles records of licensed drivers and car owners. In what ways might this list undercover certain sectors of the population?

Answers

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6.31

- (a) Is normal approximation appropriate? yes
- (b) Find the mean and std. dev. for x . $\mu=7.5, \sigma=2.29$
- (c) Find $P(6 \leq x \leq 9)$. .6156
- (d) Use Table 1 in Appendix I to find the exact probability $P(6 \leq x \leq 9)$. .618

6.33 Let x be a binomial random variable with $n = 100$ and $p = .2$. Find approximations to these probabilities.

- (a) $P(x > 22)$.26
- (b) $P(x \geq 22)$.35
- (c) $P(20 < x < 25)$.30
- (d) $P(x \leq 25)$.92

6.40 What is the probability of observing a value x equal to 60 or more? .09

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7.3 A population contains 50,000 voters. Use the random number table to identify the voters to be included in a random sample of $n = 10$.
Go down the first column, skipping numbers which are bigger than 50,000.

10480
22368
24130
42167
37570
28918
09429
10365
07119
02368

7.5 A random sample of public opinion in a small town was obtained by selecting every tenth person who passed by the busiest corner in the downtown area. Will this sample have the characteristics of a random sample selected from the town's citizens?

*Overrepresents downtown office workers.
Underrepresents people in nursing homes.*

7.7 In many states, lists of possible jurors are assembled from voter registration lists and Department of Motor Vehicles records of licensed drivers and car owners. In what ways might this list undercover certain sectors of the population?

Undercovers poor people who tend not to vote and not to have cars.