

1. a) Draw a stem and leaf display for the data set:

15 35 31 27 16 34 16 13 22 35

b) Write down any three data points (that are not equally spaced) and calculate

(i) their mean _____

(ii) their median _____

Is it possible for the mean of a data set to be larger than its median? YES NO (Circle one)

Is it possible for the mean of a data set to be smaller than its median? YES NO (Circle one)

2. A sample of 100 students' enrollment in three courses A, B, C yielded the following results:

64 are enrolled in Course A, 60 in Course B, 50 in Course C
39 are enrolled in both A and B, 31 in both A and C, 33 in both B and C, and 23 are enrolled in all three courses.

(i) Draw a Venn diagram to represent this information.

(ii) How many of the students are taking exactly two courses?

(iii) Given that a random student from the sample is taking Course C, what is the probability she is also taking Course B?

(iv) Is the event "taking Course C" favorable,
unfavorable or indifferent (independent) for the
event "taking Course B"? (Circle one)

3. a) Suppose a discrete random variable X can = 1 2 3 4
with respective probabilities .1 .2 .3 .4

Find (i) $P(X \text{ is odd})$

(ii) $E(X)$

(iii) $E(X^2)$

(iv) $\text{Var}(X)$

b) Suppose a cereal comes with one of 10 different coupons, one random coupon in each box. If you buy 6 boxes, what is the probability

(i) all 6 coupons will be different _____

(ii) there will be some duplicate coupons _____

4. a) Suppose accidents on a worksite obey a Poisson process averaging 5 accidents per year (365 days). What is the probability that there will be no accident next month (30 days)? _____

- b) Suppose X is a binomial random variable with parameters $n = 48$ and $p = 1/4$. Exactly how many possible values of X satisfy

$$|X-12| \geq 8? \text{ _____}$$

What does Chebychev's Inequality tell you about

$$(i) P(|X-12| \geq 3)$$

$$(ii) P(|X-12| \geq 8)$$

5. a) A manufacturer claims only 5% of its computer processing chips fail within the first month. You test 20 of the chips and find that 4 of them fail within a month.

So you suspect the claim is false. What probability would you compute to give a numerical value to your suspicion?

Compute this probability.

- b) You deal a poker hand of 5 cards from an ordinary deck of 52.

What is the probability it contains exactly 3 spades? _____