

(12.5 points) 1. (a) Complete the given the frequency table, with appropriate sums, and find

x	1	2	3	4	5	6	
f	10	30	20	5	10	5	
xf							
x^2f							
cf							

(b) the **depth** of the median

(c) the **median**

(12.5 points) 2. Using the data in problem 1., above, find (a) the **mean**

(b) the **midrange**

(c) the **mode**

(d) the **depth** of the third quartile, Q_3

(e) the **third quartile**, Q_3 .

(12.5 points) 3. Using the data in problem 1., above, find

(a) the **depth** of the 45th percentile

(b) the **45th percentile**

(c) the **sample variance**

(d) the **sample standard deviation**

(12.5 points) 4. (a) We want to include at least 72% of an unknown distribution within k standard deviations of its mean. Find the smallest k that will guarantee this.

(b) X has a distribution with mean 45 and standard deviation 25. Find the **z-score** for $X = 80$.

(c) Classify the following variables as qualitative nominal, qualitative ordinal, quantitative discrete, or quantitative continuous.

(a) "High", "Medium" or "Low" heat _____

(b) The number of calculators you have. _____

(c) Your favorite vegetable _____

(12.5 points) 5. (a) Complete the table, and find

x	y	x^2	y^2	xy
2	1			
4	3			
6	4			
7	4			

(b) $SS(x) =$

(c) $SS(y) =$

(d) $SS(xy) =$

(e) Find r , the **coefficient of linear correlation**.

(f) Find the **equation of line of best fit** in the form $y = mx + b$

(g) Predict y if $x = 8$.

(12.5 points) 6. One card is drawn at random from a standard deck of 52 cards. Events are D = diamond, R = red card, L = card lower than a six, F = face card.

(a) From these events list a **pair** of events that are

(i) **mutually exclusive** _____

(ii) **independent** _____

(iii) **neither** independent not mutually exclusive. _____

(b) Find the **probabilities**, as simplified fractions.

(i) $P(F) =$

(ii) $P(D \cap F) =$

(iii) $P(D | F)$

(12.5 points) 7. A natural number from 1 to 60, inclusive, is drawn at random. (Each of the 60 numbers has probability $1/60$ of being drawn.) Let E be the event "the number is even", and G be the event "the number is a multiple of 11". Find

(a) $P(E) =$

(b) $P(G) =$

(c) $P(E \cap G)$

(d) $P(E \cup G)$

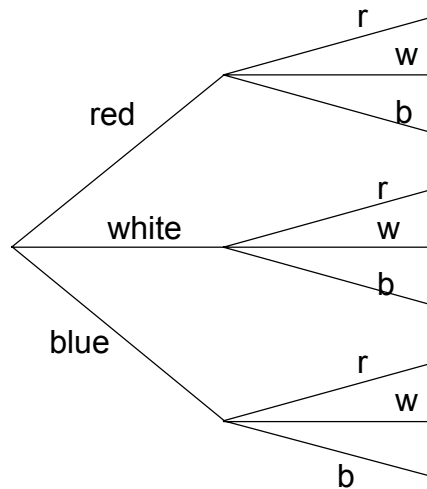
(e) $P(G | E)$

(f) if E and G are independent or not. (**explain**)

(12.5 points) 8. An urn contains five red marbles, two white marbles and three blue marbles. We draw two marbles, one at a time, without replacement.

(a) What is the probability of getting a red marble on the second draw, **given that** we got a blue one on the first draw?

(b) In the **tree diagram** below, label each branch with its **conditional** probability, and each branch tip with its probability.



(c) What is the **sum** of the branch tip probabilities? What should it be?

(12.5 points) 9. We get 15% of our parts from supplier A, 35% from supplier B, 30% from supplier C, and 20% from supplier D.

(a) Make a **Pareto Diagram** for these data.

(b) Defective rates are 8% of A parts, 2% of B parts, 4% of C parts, and 6% of D parts. (These are conditional probabilities.)

(i) Find the probability that a randomly chosen part is both defective **and** from supplier A. (Hint: multiplication rule for conditional probability.)

(ii) By finding the probabilities for 'defective and from B', 'defective and from C', and 'defective and from D', and then adding these to the answer for (i), obtain the probability that a randomly chosen part is defective.

(100 points, total.)