

F74061036 常宝利 HW-1

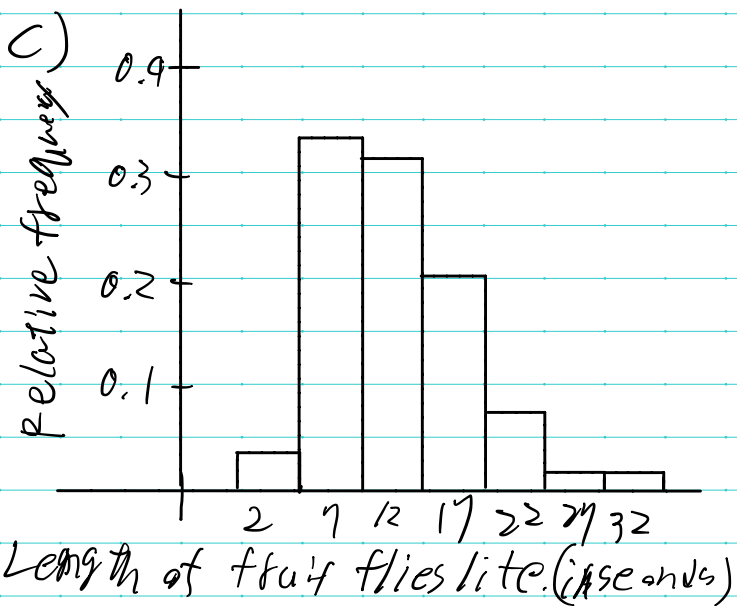
1.20 The following data represent the length of life, in seconds, of 50 fruit flies subject to a new spray in a controlled laboratory experiment:

17 20 10 9 23 13 12 19 18 24
12 14 6 9 13 6 7 10 13 7
16 18 8 13 3 32 9 7 10 11
13 7 18 7 10 4 (27) 19 16 8
7 10 5 14 15 10 9 6 7 15

- Construct a double-stem-and-leaf plot for the life span of the fruit flies using the stems 0*, 0., 1*, 1., 2*, 2., and 3* such that stems coded by the symbols * and . are associated, respectively, with leaves 0 through 4 and 5 through 9.
- Set up a relative frequency distribution.
- Construct a relative frequency histogram.
- Find the median.

a) stem.	Leaf	Frequency
0*	3 4	2
0.	5 6 6 7 7 7 7 7 8 8 9 9 9	17
1*	0 0 0 0 0 1 2 2 3 3 3 3 4 4	16
1.	5 5 6 6 7 8 8 8 9 9	10
2*	0 3 4	3
2.	7	1
3*	2	1

b) class interval	Class Midpoint	Frequency	Relative Frequency
0-4	2	2	0.04
5-9	7	17	0.34
10-14	12	16	0.32
15-19	17	10	0.20
20-24	22	3	0.06
25-29	27	1	0.02
30-34	32	1	0.02



$$d) \bar{x} = \frac{1}{2} (x_{n/2} + x_{n/2+1})$$

$$= \frac{25 + 26}{2} = \frac{10 + 11}{2} = 10.5$$

2.8 For the sample space of Exercise 2.4,

- (a) list the elements corresponding to the event A that the sum is greater than 8;
- (b) list the elements corresponding to the event B that a 2 occurs on either die;
- (c) list the elements corresponding to the event C that a number greater than 4 comes up on the green die;
- (d) list the elements corresponding to the event $A \cap C$;
- (e) list the elements corresponding to the event $A \cap B$;
- (f) list the elements corresponding to the event $B \cap C$;
- (g) construct a Venn diagram to illustrate the intersections and unions of the events A , B , and C .

a) $\{(3,6), (4,5), (4,6), (5,4), (5,3), (5,6)\}$
 $A = \{(6,3), (6,4), (6,5), (6,6)\}$

b) $\{(1,2), (2,2), (3,2), (4,2), (5,2), (6,2)\}$
 $B = \{(2,1), (2,3), (2,4), (2,5), (2,6)\}$

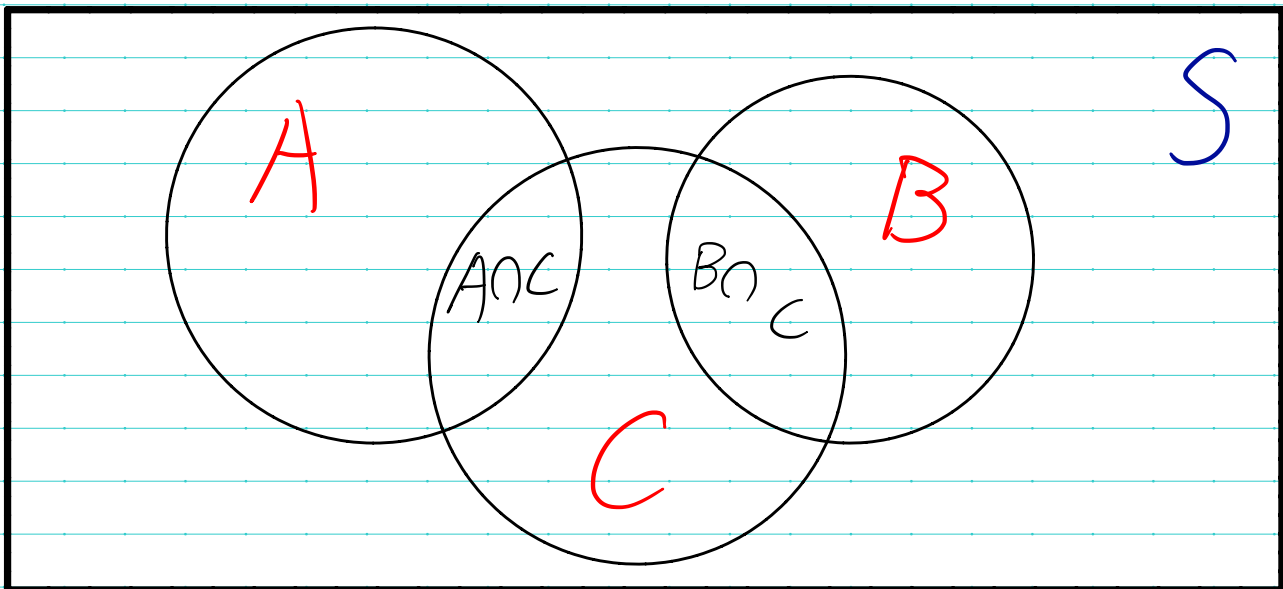
c) $\{(5,1), (5,2), (5,3), (5,4), (5,5)\}$
 $C = \{(5,6), (6,1), (6,2), (6,3), (6,4), (6,5), (6,6)\}$

d) $A \cap C = \{(5,4), (5,5), (5,6), (6,3), (6,4), (6,5), (6,6)\}$

e) $A \cap B = \emptyset$

f) $B \cap C = \{(5,2), (6,2)\}$

g) from a) ~ f)



2.20 Referring to Exercise 2.19 and the Venn diagram of Figure 2.5, list the numbers of the regions that represent the following events:

- The family will experience no mechanical problems and will not receive a ticket for a traffic violation but will arrive at a campsite with no vacancies.
- The family will experience both mechanical problems and trouble in locating a campsite with a vacancy but will not receive a ticket for a traffic violation.
- The family will either have mechanical trouble or arrive at a campsite with no vacancies but will not receive a ticket for a traffic violation.
- The family will not arrive at a campsite with no vacancies.

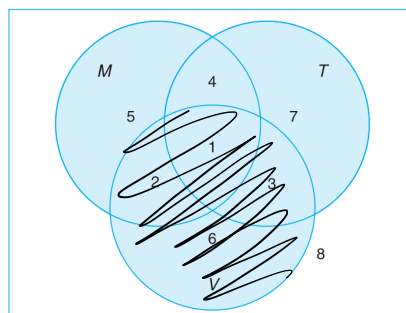


Figure 2.5: Venn diagram for Exercises 2.19 and 2.20.

a) M and T will not occur, but V will occur.
This presented by Region 6

b) M and V will occur, but T will not occur
This Presented by Region 2

c) M or V will occur, but T will not occur
Region 5 & 6

d) V will not occur, but M and T may/may not occur
Region 4, 5, 7, & 8

2.32 (a) In how many ways can 6 people be lined up to get on a bus?

(b) If 3 specific persons, among 6, insist on following each other, how many ways are possible?

(c) If 2 specific persons, among 6, refuse to follow each other, how many ways are possible?

$$a) 6! = 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 720$$

720 ways

b) 3 specific persons could be cant as 1 person.
so 4 persons instead of 6 persons.

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$$

and within those 3 people,

$$3! = 3 \cdot 2 \cdot 1 = 6$$

so combine them

$$24 \cdot 6 = 144 \quad 144 \text{ ways}$$

c) first we think those 2 people lining up,
so we follow what we did in b),

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

$$2! = 2 \cdot 1 = 2$$

$$2 \cdot 120 = 240$$

and 2 people not lining up is 240 possibility being ignored,

$$720 - 240 = 480$$

480 ways,

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```
>> load lamp_life.txt
boxplot(lamp_life)
xlabel('All Lamps')
ylabel('Lmaps Life Time')
title('Life of 50 lamps')
>>
```

919 1196 1156 920 1170 929 1045 855 938 970 978 832 765 958 1217
1085 702 923 785 1126 936 918 948 1067 1092 1162 950 905 972 1035
1195 1195 1340 1122 1237 956 1102 1157 1009 1157 1151 1009 902 1022
1333 811 896 958 1311 1037

