Probability and statistics Yr 10

UNIT 6: Review of statistics

QUESTION 1 Fifty families were surveyed to find how many children each family has and the following set of data was obtained.

5	3	2	4	1	5	0	2	3	2	2	1	1	3	3
4	1	3	2	1	3	3	2	2	2	3	2	1	3	1
2	3	0	1	1	5	3	4	5	0	3	0	2	0	2
2	1	5	4	3										

a Complete the frequency distribution table.

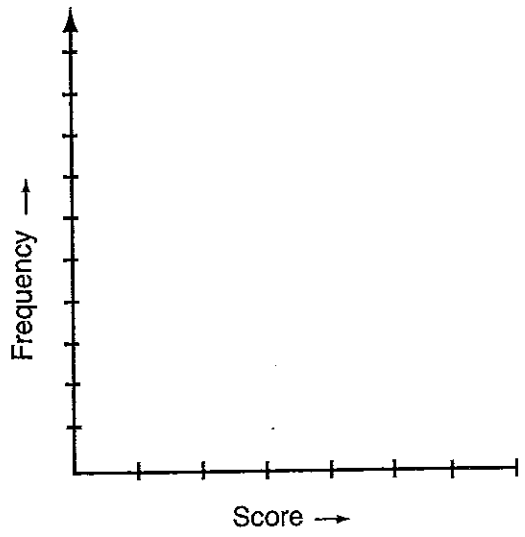
b Draw a frequency histogram.

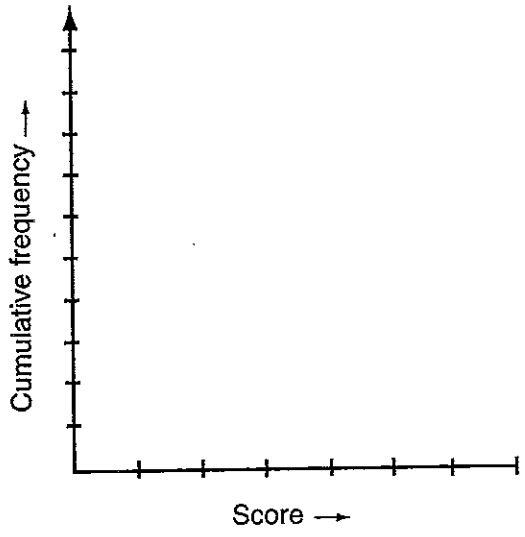
c Draw a frequency polygon.

d Draw a cumulative frequency histogram.

e Draw a cumulative frequency polygon.

Score (x)	Tally	Frequency (f)	Cumulativ frequency
0			
1			
2			
3			
4			
5			
		$\Sigma f =$	





QUESTION 2 For the frequency distribution given above, calculate:

a the mean _____

b the mode _____

c the range _____

d the median _____

e the relative frequency _____

Probability and statistics

UNIT 7: Measures of spread, standard deviation

QUESTION 1 Use your calculator to find the mean and standard deviation, correct to one decimal place, for the following sets of scores. Also find the range of each set of scores.

a 2, 4, 8, 9, 10

b 1, 2, 3, 4, 5, 6, 7

c 7, 11, 12, 13, 14, 15, 16, 17, 18

d 35, 46, 48, 40, 36, 41, 42, 37

e 8, 3, 7, 3, 9, 5, 8, 8, 6, 9, 3, 6, 2, 3

f 5, 8, 10, 15, 15, 10, 8, 9, 18, 20, 18, 15, 10, 15

g

Score	5	7	9	11	13	15
Frequency	8	5	7	8	3	6

h

Score	10	20	30	40	50	60	70
Frequency	3	4	3	2	5	2	3

QUESTION 2 Five students sat for a mathematics test and a science test. Their marks are given below.

Science	56	60	69	59	65
Mathematics	70	75	86	82	80

a Find the mean and standard deviation for each set of scores.

b Michael scored 69 in science and 86 in mathematics. Which was the better average mark?

c If Matthew scored 65 in science and 80 in mathematics, in which subject did Matthew perform better compared with the class average?

d Use your calculator to find the standard deviation and the mean for each test.

Test A	8	10	13	13	14	15	16	18	16	17
Test B	3	11	15	15	9	10	7	16	16	19

For which test would the result 16 be better compared with the class average?

UNIT 8: Measures of spread, interquartile range

QUESTION **1** For the following set of scores, 2, 3, 3, 4, 5, 7, 9, 9, 10, 11, 12, 12, find:

a the 1st quartile (Q1)

b the 2nd quartile (Q2) – (the median)

c the 3rd quartile (Q3)

d the interquartile range

QUESTION **2** Complete the cumulative frequency table and draw a cumulative frequency histogr from the completed table.

Score	55	56	57	58	59	60	61	62	63
Frequency	1	2	4	6	7	12	8	5	3
Cumulative frequency									

From the graph find:

a the median

b the lower quartile

c the 80th percentile

d the interquartile range

e the mode

QUESTION **3** Find the interquartile range of the following sets of scores.

a 5, 2, 3, 6, 8, 9, 6, 8

b 8, 10, 12, 10, 12, 11, 13, 12, 10, 12, 10, 12, 10, 11, 13, 14, 13, 12, 10, 11

UNIT 9: TOPIC TEST

SECTION

Probability and statistics

Instructions for SECTION 1

- You have 15 minutes to answer Section 1
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators are NOT to be used
- Fill in only ONE CIRCLE for each question

Mark

1 From a pack of 52 cards, one card is drawn at random. Find the probability of drawing a diamond.

Ⓐ $\frac{1}{13}$ Ⓑ $\frac{2}{13}$ Ⓒ $\frac{1}{4}$ Ⓓ $\frac{3}{4}$ 2

2 In a single throw of one die, find the probability of throwing an odd number.

Ⓐ $\frac{1}{6}$ Ⓑ $\frac{1}{3}$ Ⓒ $\frac{1}{2}$ Ⓓ $\frac{2}{3}$ 2

3 In a single throw of two dice, find the probability of throwing a double.

Ⓐ $\frac{1}{6}$ Ⓑ $\frac{2}{3}$ Ⓒ $\frac{1}{2}$ Ⓓ $\frac{3}{4}$ 2

4 For the set of scores, 5, 8, 3, 1, 9, 5, 6, 7, find the range.

Ⓐ 6 Ⓑ 7 Ⓒ 8 Ⓓ 9 2

5 For the set of scores, 10, 20, 50, 10, 60, what is the difference between the mean and the mode?

Ⓐ 10 Ⓑ 20 Ⓒ 30 Ⓓ 40 2

6 The test marks of 10 students are 5, 9, 5, 7, 3, 7, 8, 7, 9, 7. What is the modal mark?

Ⓐ 6 Ⓑ 7 Ⓒ 8 Ⓓ 9 2

7 For the following set of scores, 3, 1, 4, 6, 5, 5, 7, 3, 4, 5, 4, 5, 7, the mode is

Ⓐ 6 Ⓑ 4.538 Ⓒ 5 Ⓓ 4 2

8 Find the range of the set of scores 8, 9, 12, 7, 9, 11, 8, 9, 5, 13, 7, 9.

Ⓐ 7 Ⓑ 9 Ⓒ 4 Ⓓ 8 2

9 The median of the numbers 6, 4, 9, 7, 4, 2, 8, is

Ⓐ 8 Ⓑ 6 Ⓒ 5 Ⓓ 4 2

10 The mean of the numbers 8, 10 and x is the same as the mean of the numbers 6, 8, 10 and 12. Find the value of x.

Ⓐ 6 Ⓑ 9 Ⓒ 10 Ⓓ 12 2

Total marks achieved for SECTION 1 /20

UNIT 9: TOPIC TEST

SECTION

Probability and statistics

Instructions for SECTION 2

- You have 20 minutes to answer ALL of Section 2
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators may be used

Questions	Answers	Mar
A bag contains 3 yellow, 2 blue and 4 white balls. If a ball is drawn at random, find the probability that it is:		
1 yellow.		2
2 blue.		2
3 not white.		2
A coin is tossed three times and the results noted. Use a tree diagram to find the probability of:		
4 three tails.		2
5 two tails and one head in any order.		1
6 at least one tail.		1
A pair of dice is rolled simultaneously. Find the probability of getting:		
7 a double five.		1
8 any double.		
9 a score greater than 9.		
10 at least one six on the uppermost face of a die.		
11 the sum of the two numbers rolled being 11.		
12 two even numbers.		
Use your calculator to find the mean and standard deviation, correct to one decimal place, for the following sets of scores.		
13 8, 9, 6, 9, 7, 6, 6		
14 12, 14, 9, 6, 1, 12		
15 25, 33, 26, 56, 44, 41, 33, 25		

Total marks achieved for SECTION 2

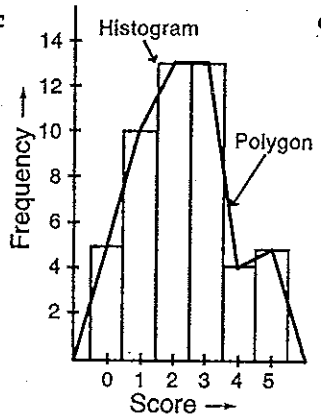
Answers

Page 46

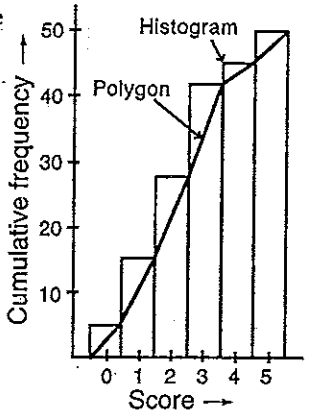
1 a

x	Tally	f	$c.f.$
0	𝍸	5	5
1	𝍸 𝍸	10	15
2	𝍸 𝍸 III	13	28
3	𝍸 𝍸 III	13	41
4	IIII	4	45
5	𝍸	5	50

b/c



d/e



2 a 2.32 b 2 and 3 c 5 d 2

e

Score	0	1	2	3	4	5
Relative f	0.1	0.2	0.26	0.26	0.08	0.1

Page 47 1 a $\bar{x} = 6.6$, SD = 3.07, range = 8 b $\bar{x} = 4$, SD = 2, range = 6 c $\bar{x} = 13.67$, SD = 3.20, range = 11 d $\bar{x} = 40.63$, SD = 4.36, range = 1
e $\bar{x} = 5.71$, SD = 2.43, range = 7 f $\bar{x} = 12.57$, SD = 4.39, range = 15 g $\bar{x} = 9.59$, SD = 3.41, range = 10 h $\bar{x} = 39.1$, SD = 19.75, range = 60
2 a Science: $\bar{x} = 61.8$, SD = 4.62; Mathematics: $\bar{x} = 78.6$, SD = 5.57 b Science c Science d Test A: $\bar{x} = 14$, SD = 2.97; Test B: $\bar{x} = 12.1$, SD = 4.6
The result is better for Test B.

Page 48 1 a 3.5 b 8 c 10.5 d 7 2 a 60 b 58 c 61 d 3 e 60
3 a 4 b 2

Page 49 1 C 2 C 3 A 4 C 5 B 6 B 7 C 8 D 9 B 10 B

Page 50 1 $\frac{1}{3}$ 2 $\frac{2}{9}$ 3 $\frac{5}{9}$ 4 $\frac{1}{8}$ 5 $\frac{3}{8}$ 6 $\frac{7}{8}$ 7 $\frac{1}{36}$ 8 $\frac{1}{6}$
9 $\frac{1}{6}$ 10 $\frac{11}{36}$ 11 $\frac{1}{18}$ 12 $\frac{1}{4}$ 13 $\bar{x} = 7.29$, SD = 1.28
14 $\bar{x} = 9$, SD = 4.40 15 $\bar{x} = 35.375$, SD = 10.28

x	f	$c.f.$
55	1	1
56	2	3
57	4	7
58	6	13
59	7	20
60	12	32
61	8	40
62	5	45
63	3	48