MATHLETICS
Inspiring Better Results

Statistics and Probability

Student Book - Series 1-1

Mathletics Instant Workbooks

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Statistics and probability

Student Book - Series I

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Topic 1: Frequency distribution table

Question 1

a A survey involves the test results obtained by a class of 24 students. Complete a frequency distribution table for the set of data given below.

5 9 7 7 5 6 7 6

7 8 6 6 8 6 5 4

3 6 7 9 8 9 7 9

Score (x)	Tally	Frequency (f)

b The following table shows the heights in centimetres of 28 students in a class. Complete a frequency distribution table.

166 169 170 167 171 172 166

168 172 171 169 170 170 167

173 174 167 168 167 172 171

174 170 174 172 172 167 165

Score (x)	Tally	Frequency (f)

Question 2

a A class of 20 students scored the following marks. Draw up a frequency distribution table.

5, 0, 7, 6, 7, 2, 3, 5, 3, 5, 10,
8, 7, 6, 3, 4, 7, 10, 7, 2

Score (x)	Tally	Frequency (f)

b Draw up a frequency distribution table for the following set of data.

7, 6, 4, 6, 9, 8, 6, 6, 5, 7, 9,

10, 9, 6, 5, 6, 6, 6, 10, 9

Score (x)	Tally	Frequency (f)

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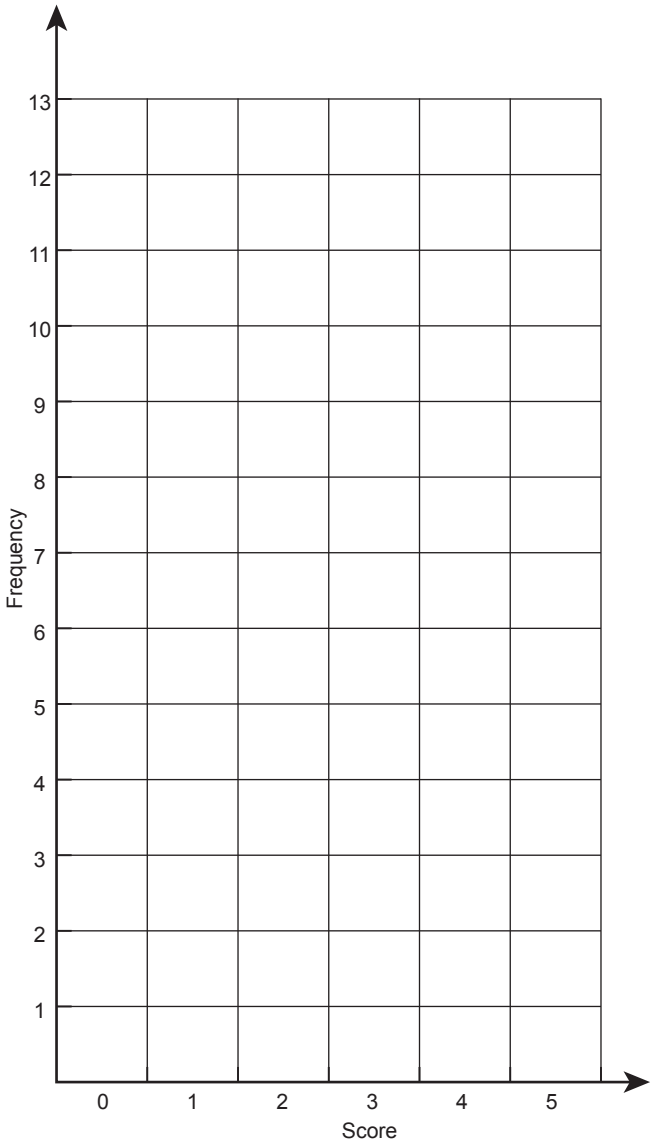
Topic 2: Frequency histogram and frequency polygon

QUESTION **1** Fifty families were surveyed to find how many children each family has and the following set of data was obtained. Draw a frequency histogram and a frequency polygon.

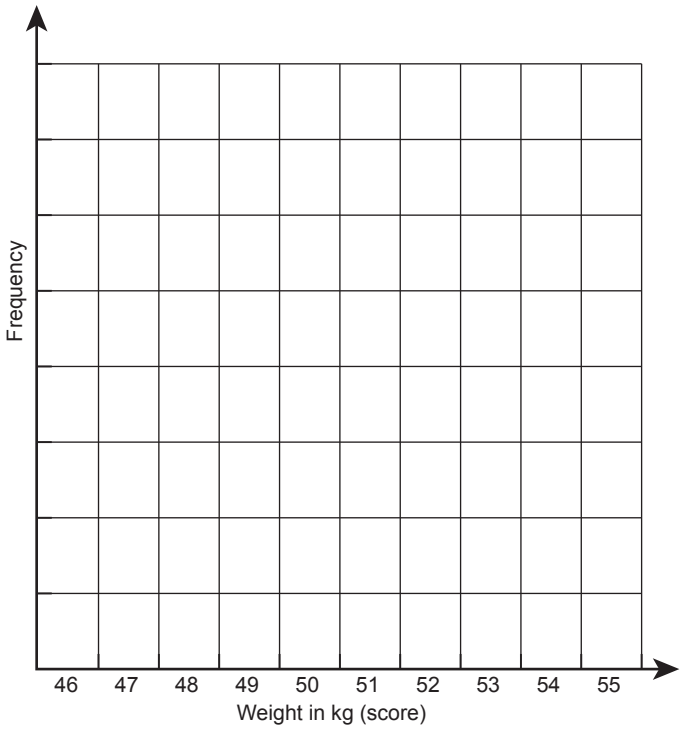
5	3	2	4	1	5	0	2	3	2
2	1	1	3	3	4	1	3	2	1
3	3	2	2	2	3	2	1	3	1
2	3	0	1	1	5	3	4	5	0
3	0	2	0	2	2	1	5	4	3



QUESTION **2** The weights of 30 students in a class are shown in the following table. Construct a frequency distribution table and hence draw a frequency histogram and a frequency polygon.

52	48	46	53	50	47	50	49
48	51	52	46	48	48	46	49
48	48	54	50	46	48	46	49
50	46	52	46	47	51		

Score (x)	Tally	Frequency (f)



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Topic 3: Mean

QUESTION **1** Find the mean of the following sets of scores.

a 4, 5, 6

b 6, 7, 8, 12

c 7, 8, 9, 10

d 10, 12, 14, 18

e 5, 7, 10, 12

f 5, 6, 9, 10, 12, 18

g 2, 2, 3, 3, 3, 3, 4, 4, 4, 4

h 6, 6, 7, 7, 7, 8, 8, 8, 8

i 2, 2, 5, 5, 5, 6, 6, 6, 6

QUESTION **2** Find the mean of the following sets of scores.

a 3, 3, 3, 4, 4, 5, 5, 5, 5, 6, 6

b 2, 2, 2, 3, 3, 3, 3, 5, 5, 5, 5, 6, 6, 6, 6

c 5, 5, 5, 7, 7, 7, 7, 7, 9, 9, 9, 9

d 5, 5, 5, 6, 6, 6, 7, 7, 7, 7, 7, 8, 8, 8, 8

QUESTION **3** Complete the tables below and calculate the mean.

a

(x)	*(f)*	*(fx)*
2	3	
3	5	
4	2	
5	2	
6	3	
Mean		

b

(x)	*(f)*	*(fx)*
0	2	
1	3	
2	4	
3	2	
4	3	
Mean		

c

(x)	*(f)*	*(fx)*
1	2	
2	3	
3	4	
4	2	
5	3	
Mean		

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Topic 4: Mode

QUESTION **1** What is the mode of the following sets of scores?

a 2, 2, 3, 4, 4, 5, 5, 5, 6, 6

_____

b 7, 8, 7, 5, 3, 2, 7, 6, 7, 3

_____

c 2, 3, 5, 4, 2, 8, 7, 2, 2

_____

d 5, 3, 4, 6, 5, 6, 7, 5, 5

_____

e 4, 5, 6, 7, 6, 8, 9, 6, 4, 6

_____

f 7, 8, 9, 9, 9, 9, 10, 7

_____

g 3, 4, 5, 3, 5, 3, 3, 6, 3, 4

_____

h 2, 3, 3, 2, 4, 2, 5, 6, 5, 3, 3

_____

QUESTION **2** Find the mode of each set of scores.

a 4, 3, 5, 3, 6, 4, 3, 5, 3

_____

b 11, 10, 11, 12, 9, 9, 8, 11, 11, 8, 11

_____

c 7, 8, 6, 9, 9, 7, 9, 9, 7, 6, 9, 9, 10

_____

d 6, 7, 9, 7, 6, 7, 6, 7, 7, 7, 8, 7, 7

_____

e 21, 20, 21, 24, 21, 22, 21, 21

_____

f 4, 5, 4, 3, 4, 2, 4, 4, 2, 4, 4

_____

g 52. 17, 18, 52, 53, 54, 52, 52, 53, 52

_____

h 9, 4, 5, 9, 7, 9, 7, 9, 6, 5, 9, 9, 4, 9

_____

QUESTION **3** Select the mode from each of the following sets of scores.

a 3, 4, 5, 4, 3, 2, 4, 4, 5, 4

_____

b 6, 5, 8, 8, 5, 8, 7, 8, 9, 8, 8

_____

c 3, 4, 5, 5, 6, 5, 6, 5, 7, 6, 5, 5, 5, 4, 5,

_____

d 8, 9, 10, 8, 11, 8, 9, 8, 10, 8, 6, 8

_____

e 2, 3, 3, 4, 2, 5, 2, 2, 2, 6, 2, 3

_____

f 5, 6, 5, 5, 7, 5, 6, 5, 5, 5

_____

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Topic 5: Median

QUESTION **1** Find the median of the following sets of scores.

a 6, 7, 8

b 14, 17, 21

c 5, 8, 10, 11, 6

d 13, 17, 19, 15, 14

e 5, 3, 6, 4, 7

f 20, 22, 19, 17, 16

QUESTION **2** What is the median of each set of scores?

a 6, 7, 8, 9, 10

b 16, 18, 11, 15, 12, 17, 13, 14, 18

c 12, 62, 42, 22, 52, 92, 72, 82, 32

d 12, 4, 9, 6, 5, 8, 10, 11, 7, 10, 12

e 11, 14, 9, 6, 5, 6, 11, 10, 8, 7, 14

f 5, 10, 4, 8, 11, 8, 6, 9, 10, 11, 11

QUESTION **3** Find the median of the following sets of scores.

a 36, 39, 31, 32, 35, 36, 39

b 3, 2, 1, 3, 0, 8, 6, 6, 0

c 8, 11, 16, 13, 12, 13, 16, 11, 8, 7, 8

d 7, 13, 6, 10, 13, 10, 8, 11, 12, 13, 13

e 3, 7, 9, 5, 4

f 16, 18, 15, 13, 12

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Topic 6: Range

QUESTION **1** Find the range of the following sets of scores.

a 2, 6, 8, 1, 3

_____

b 7, 1, 0, 3, 5

_____

c 4, 8, 2, 1, 5, 10

_____

d 9, 6, 2, 1, 8, 6, 7

_____

e 3, 5, 5, 2, 7, 9, 11

_____

f 5, 2, 3, 10, 15, 2, 1

_____

g 5, 2, 7, 15, 1, 18

_____

h 21, 23, 29, 21, 19, 10

_____

i 2, 5, 1, 3, 9, 2, 15

_____

j 1, 9, 10, 23, 8, 7, 5

_____

QUESTION **2** Find the range of the following sets of scores.

a 2, 5, 3, 8, 21, 2, 5

_____

b 0, 5, 1, 0, 8, 15, 27

_____

c 1, 5, 3, 8, 53, 5, 6, 7

_____

d 2, 8, 9, 13, 27, 8, 31

_____

e 37, 6, 5, 8, 41, 2, 63, 69

_____

f 10, 5, 1, 8, 9, 25, 28, 6, 34

_____

g 2, 5, 0, 3, 9, 11, 13, 15

_____

h 1, 3, 5, 8, 9, 15, 0

_____

i 3, 5, 17, 8, 9, 0

_____

j 10, 20, 30, 40, 50, 60

_____

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

a 2, 8, 9, 4, 15, 7, 6, 32

_____

b 5, 6, 7, 2, 3, 8, 14, 17, 5

_____

c 5, 3, 9, 18, 7, 64, 32

_____

d 10, 12, 20, 15, 16, 7

_____

e 46, 33, 46, 10, 10, 44

_____

f 13, 21, 20, 27, 25, 27

_____

g 12, 17, 15, 37, 31

_____

h 124, 132, 116, 132, 128, 166

_____

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Topic 7: Miscellaneous questions

QUESTION **1** A class of 20 students scored the following marks (out of 10) in a mathematics test:

5 1 7 6 7 9 8 7 6 3

2 3 5 3 5 4 7 9 7 2

a Draw up a frequency distribution table.

b Draw a frequency histogram.

c Draw a frequency polygon.

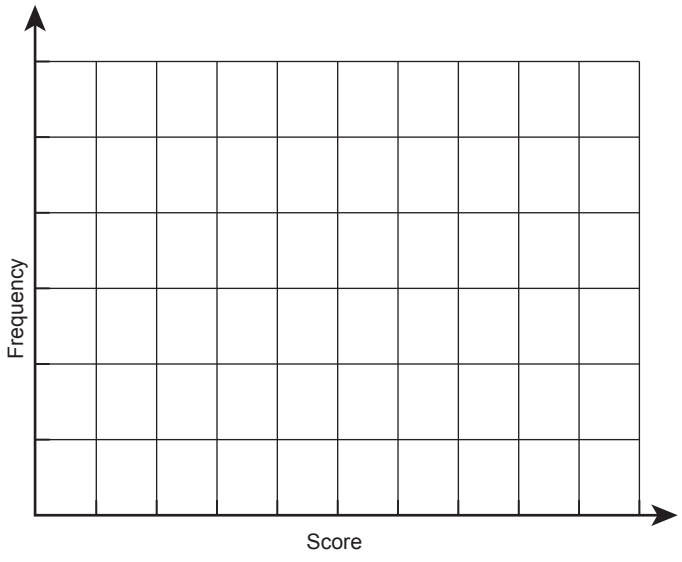
d Calculate the mean._____

e Calculate the mode. _____

f Calculate the median. _____

g Calculate the range. _____

Score (*x*)	Tally	Frequency (*f*)



QUESTION **2** Below are the number of goals scored by a soccer team in 30 matches.

3 0 2 1 5 2 1 4 2 0

0 4 1 3 0 3 2 3 1 2

1 0 4 2 2 0 1 5 2 1

a Organise these scores into a frequency distribution table.

b Draw a frequency histogram.

c Draw a frequency polygon.

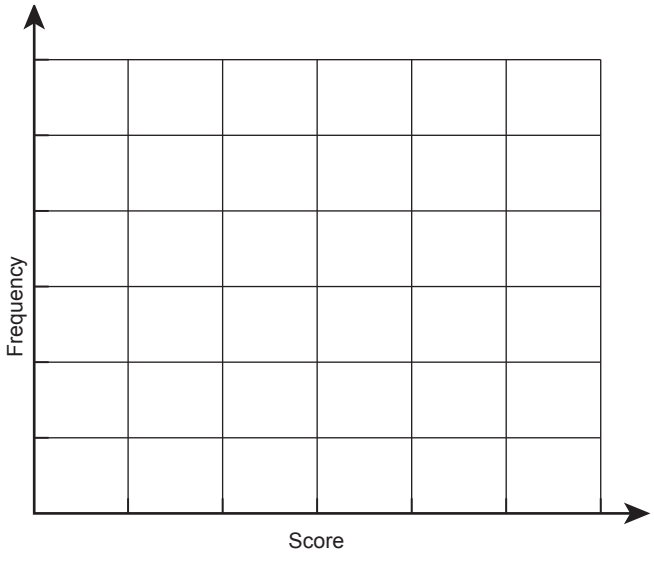
d Calculate the mean._____

e Calculate the mode. _____

f Find the median. _____

g Find the range. _____

Score (*x*)	Tally	Frequency (*f*)



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Topic 8: Basic probability

QUESTION **1** A bag contains 7 red, 10 blue and 3 yellow balls. If a ball is drawn at random, find the probability that it is

a blue _____ **b** red _____ **c** yellow _____

d not red _____ **e** non yellow _____ **f** white _____

QUESTION **2** A die is thrown once. Find the probability that it is

a a six _____ **b** an odd number _____

c an even number _____ **d** one or five _____

e zero _____ **f** any number from 1 to 6 _____

QUESTION **3** From the letters of the word 'AUSTRALIA', one letter is selected at random. What is the probability that the letter is

a a vowel _____ **b** a consonant _____

c the letter A _____ **d** the letter S _____

QUESTION **4** A card is drawn at random from a normal pack of 52 cards. Find the probability that the card is

a a spade _____ **b** a black card _____ **c** a queen _____

d a red card _____ **e** not a club _____ **f** an ace or a jack _____

QUESTION **5** A three-digit number is to be formed from the digits 4, 5 and 9. What is the probability that:

a the number formed is odd? _____ **b** the number formed is even? _____

c the number is less than 900? _____ **d** the number is divisible by 5? _____

QUESTION **6** The numbers from 1 to 10 are written on separate cards. One card is chosen at random. What is the probability that the number is:

a odd _____ **b** even _____

c seven _____ **d** more than seven _____

e less than seven _____ **f** zero _____

g a prime number _____ **h** divisible by 3 _____

i a factor of 5 _____ **j** a multiple of 4 _____

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Topic 9: Probability and tree diagrams

QUESTION **1** A coin is tossed twice. What is the probablility of having

a two heads? _____

b a head and tail in any order? _____

c two tails? _____

d no heads? _____

QUESTION **2** There are four cards marked with the numbers 2, 3, 4 and 5. They are put in a box. Two cards are selected at random one after the other to form a two-digit number.

a How many different two-digit numbers can be formed? _____

b The probability of a number less than 35 = _____

c The probability that the number formed is divisible by 5 = _____

d The probability of an odd number = _____

e The probability of an even number = _____

f The probability of a number greater than 50 = _____

QUESTION **3** Michelle has a box containing one red marble and two green marbles. She selects two marbles at random. Find the probability of

a two green marbles if she replaces the first marble before she selects the second. _____

b one red marble if she does not replace the first marble. _____

QUESTION **4** Three coins are tossed together. What is the probability that

a two heads and a tail will be thrown? _____

b three heads will be thrown? _____

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Topic 10: Problem solving, statistics and probability

1 What is the mean of the first five counting numbers? _____

2 What is the mean of the squares of each of the first five counting numbers?_____

3 If 6 is added to each of the first five counting numbers, find the new mean. _____

4 John's average weekly income is $450. What is his yearly income?_____

5 Chris covers an average distance of 125 km per day.
How many kilometres are covered in 30 days? _____

6 When a die is thrown, what is the probability of an even number turning up?_____

7 A bag contains 3 red marbles and 5 blue marbles. If one marble is drawn at random, what is the probability of drawing a red marble? _____

8 If the probability of an event occurring is $\frac{7}{10}$, how many times would you expect it to occur in 80 trials? _____

9 A card is drawn from a pack of 52. What is the probability of a King being drawn?_____

10 Jan had a weekly average income of $320 for four weeks. If she earned $300, $350 and $340 in the first three weeks, what was her income in the fourth week? _____

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Topic Test — PART A

Instructions
This part consists of 12 multiple-choice questions
Each question is worth 1 mark
Fill in only ONE CIRCLE for each question
Calculators are NOT allowed

Time allowed: 15 minutes **Total marks = 12**

		Marks
1	From the set of scores 3, 5, 4, 6, 5, 5, 3, 5, 4, 5 the mode is (A) 6 (B) 5 (C) 4.5 (D) 4	1
2	The range of the set of scores 8, 9, 11, 6, 9, 8, 5, 7, 13, 6 equals (A) 7 (B) 9 (C) 4 (D) 8	1
3	What is the difference between the mean and the mode of scores 30, 50, 60, 30, 70? (A) 2 (B) 12 (C) 18 (D) 20	1
4	'HOW NOW BROWN COW'. Which of the answers below gives the mode? (A) O only (B) W only (C) O and W only (D) O, W and N	1
5	The mean of the set of scores 3, 5, 3, 3, 7, 3, 6, 5, 4, 3 equals (A) 4.1 (B) 4.2 (C) 3 (D) 5	1
6	The median of the set of scores 2, 5, 3, 6, 2, 2, 7, 8, 2, 3, 4 equals (A) 2 (B) 3 (C) 4 (D) 5	1
7	From a normal pack of 52 playing cards, one card is selected at random. The probability of a diamond is (A) $\frac{1}{13}$ (B) $\frac{2}{13}$ (C) $\frac{1}{4}$ (D) $\frac{3}{4}$	1
8	A card is chosen at random from a pack of 52 playing cards. What is the probability that the card is red? (A) $\frac{1}{4}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{3}{4}$	1
9	In a single throw of one die, find the probability of having an even number. (A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$	1
10	In a toss of two coins, find the probability of having two tails. (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) 1	1
11	A bag contains four white, three red and two black balls. If a ball is drawn at random, the probability of a white ball is (A) $\frac{3}{9}$ (B) $\frac{4}{9}$ (C) $\frac{2}{9}$ (D) $\frac{5}{9}$	1
12	A card is chosen at random from a pack of 52 cards. What is the probability that the card is an ace? (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{1}{13}$ (D) $\frac{2}{13}$	1

Total marks achieved for PART A 12

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Topic Test — PART B

Instructions This part consists of 15 questions
Each question is worth 1 mark
Write answers in the answers-only column

Time allowed: 20 minutes **Total marks = 15**

Questions	Answers only	Marks
For the given set of scores 3, 5, 3, 3, 7, 3, 6, 5, 4, 3 find		
1 the mean	_____	1
2 the mode	_____	1
3 the median	_____	1
4 the range	_____	1
For the set of scores given opposite, find		
5 the mode	_____	1
6 the mean	_____	1
7 the median	_____	1
8 the range	_____	1
In a single throw of one die, find the probability of		
9 an odd number	_____	1
10 a three	_____	1
11 a seven	_____	1
A bag contains five red, seven blue and three white balls. If a ball is drawn at random, find the probability that it is		
12 a red ball	_____	1
13 a blue ball	_____	1
14 a white ball	_____	1
15 not a white ball	_____	1

Score	Frequency
6	4
7	5
8	7
9	6
10	3

Total marks achieved for PART B ____/15

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