



CLASSIFIED

International Examinations Papers

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MATHEMATICS - CORE **TOPIC- STATISTICS (Collect,** **classify and tabulate)**

- 1 (a) In 2001 Arnold was x years old.
Ken is **34 years younger** than Arnold.

- (i) Complete the table, in terms of x , for Arnold's and Ken's ages.

	2001	2013
Arnold's age	x	
Ken's age		

[3]

- (ii) In 2013 Arnold is **three** times as old as Ken.

Write down an equation in x and solve it.

Answer(a)(ii) $x =$ [4]



2. Write down a set of five numbers that has

- a mode of 3
- and
- a median of 6
- and
- a range of 5.

Answer , , , , [3]

03

Bryony asks her friends how many pets they have.
She is going to use this table to record her results.

Number of pets	Frequency
0-1	
1-2	
2-3	
3 or more	

Explain what is wrong with this frequency table.

Answer

..... [1]



13 17 13 17 19 13 31 21 29

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04 (a) For the numbers above, find

(i) the range,

Answer(a)(i) [1]

(ii) the median.

Answer(a)(ii) [2]

(b) Write down the only number in the list which is **not** a prime number.

Answer(b) [1]

05

7 2 3 5 1 2 6 9 7 2 6 4 2 3 6

For these numbers

(a) find the range,

..... [1]

(b) write down the mode.

..... [1]



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Q 6

These are the heights, correct to the nearest centimetre, of 12 children.

132 114 151 130 132 145 163 142 153 170 132 125

Find the median height.

Answer cm [2]

11/11/14

Q 7

Here are the heights, in centimetres, of 8 people.

153 175 168 158 161 172 164 172

(a) Write down the mode.

..... cm [1]

(b) Find the median.

..... cm [2]

13/11/16

Q 8

Eleven children attempt to solve a puzzle.
This list shows the number of attempts each child made.

7 6 8 5 6 5 7 8 3 8 1

(a) Write down the mode.

..... [1]

(b) Find the median.

..... [2]

09 (a)

3 5 8 10 10

For the numbers above, find

(i) the mean,

Answer(a)(i) [2]

32/5/13

(ii) the mode,

Answer(a)(ii) [1]

(iii) the median,

Answer(a)(iii) [1]

(iv) the range.

Answer(a)(iv) [1]

(v) A sixth number, **11**, is added to the list.

Write down which **one** of the mean, the mode, the median and the range will stay the same.

Answer(a)(v) [1]

10

8 15 7 8 7 15 4 13 4 3 10 2 9 4 5

(a) Write down the mode.

Answer(a) [1]

11/4/13

(b) Work out the median.

Answer(b) [2]



11

Here are the ages of the people working in the leisure industry.

16 17 19 23 23 24 27 31 33 40 45 56

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(i) Work out the range.

Answer(b)(i) years [1]

(ii) Calculate the mean.

Answer(b)(ii) years [2]

(iii) Sabrina wants to interview someone working in the leisure industry.
She chooses one person at random.

Write down the probability that the person chosen is under 30 years old.

Answer(b)(iii) [1]



12 The Patel family has six suitcases.
The number of items in each suitcase is shown below.

15 16 16 18 19 21

(i) Find the range.

Answer(c)(i) [1]

(ii) Write down the mode.

Answer(c)(ii) [1]

(iii) Work out the median.

Answer(c)(iii) [1]

(iv) Calculate the mean.

Answer(c)(iv) [2]

(v) Find the probability that a suitcase chosen at random has more than 18 items.

Answer(c)(v) [1]

(d) Mr Patel buys a bag of sweets.
The bag of sweets costs \$3.25 .

(i) Calculate the cost of the sweets in euros (€) when the exchange rate is €1 = \$1.24 .

Answer(d)(i) € [2]

(ii) The weight, w grams, of the bag of sweets is 250 g correct to the nearest 10 g.

Complete this statement about the value of w .

Answer(d)(ii) $\leq w <$ [2]



13 (a) 120 children take part in an athletics competition.

(i) Complete the table to show the number of children in each group.

	Girls	Boys	Total
Age 15			65
Age 16	44		
Total	70		120

[2]

(ii) One child is selected at random.

Find the probability that it is a girl aged 16.
Give your answer as a fraction in its lowest terms.

Answer(a)(ii) [2]

(iii) Write down the ratio number of girls aged 15 : number of boys aged 15.
Give your answer in its simplest form.

Answer(a)(iii) : [2]

(b) Here are the distances, in metres, recorded in the boys' shot putt.

9.23 6.21 9.86 8.64 7.15 7.72 9.01 7.34 6.53 6.89

(i) Find the median.

Answer(b)(i) m [2]

(ii) Find the range.

Answer(b)(ii) m [1]

(iii) Another boy was a late entry to the competition.
After his attempt, the range increased by 20 cm.

Work out the two possible distances of his attempt.

Answer(b)(iii) m or m [2]

7 3 8 2 5 1
5 3 4 6 2 3

For the numbers above work out the

(a) mode,

Answer(a) [1]

(b) median,

Answer(b) [2]

(c) range.

Answer(c) [1]

13/7/12

15 At a ski resort the temperature, in °C, was measured every 4 hours during one day.

The results were -12°, -13°, -10°, 4°, 4°, -6°.

(a) Find the difference between the highest and the lowest of these temperatures.

Answer(a) °C [1]

(b) Find

(i) the mean,

Answer(b)(i) °C [2]

(ii) the median,

Answer(b)(ii) °C [2]

(iii) the mode.

Answer(b)(iii) °C [1]

13/7/11

- 16 Alison scored the following number of runs in 15 cricket matches.

12	3	27	35	0
7	52	4	18	30
18	7	94	61	7

- (a) For these scores,
(i) work out the median,

Answer(a)(i) [2]

- (ii) write down the mode,

Answer(a)(ii) [1]

- (iii) calculate the mean.

Answer(a)(iii) [2]

- (b) These are the averages for the number of runs scored by Bethan in the 15 matches.

Median = 21 Mode = 13 Mean = 20

Alison says that her scores are better than Bethan's scores.
Bethan says that her scores are better than Alison's scores.

Explain how they could both be correct.

Answer(b)
.....
..... [2]



The monthly wages, in dollars, of 10 people are listed below.

1000	1400	1100	900	1050
1500	900	800	950	1300

(a) Calculate the mean.

Answer(a) \$ [1]

(b) Write down the mode.

Answer(b) \$ [1]

(c) Find the range.

Answer(c) \$ [1]

(d) Calculate the percentage of these people with wages greater than \$1100.

Answer(d) % [2]

(e) One person is chosen at random.

Find the probability that this person's wage is less than \$1100.

Answer(e) [1]

(f) The largest wages, \$1500, \$1400 and \$1300 are removed from the list.

Find the median of the remaining seven wages.

Answer(f) \$ [1]



An athlete runs 1500 metres in 4 minutes.

Calculate her average speed in

(a) metres per minute,

Answer(a) m/min [1]

(b) kilometres per hour.

Answer(b) km/h [2]

18 In a traffic survey of 125 cars the number of people in each car was recorded.

Number of people in each car	1	2	3	4	5
Frequency	50	40	10	20	5

Find

(a) the range,

Answer(a) [1]

(b) the median,

Answer(b) [1]

(c) the mode.

Answer(c) [1]



18 In this question, do not use your calculator and show all the steps in your working.

(a) Show that $3\frac{1}{5} - 2\frac{5}{8} = \frac{23}{40}$.

Answer(a)

[2]

(b) Work out $\frac{7}{8} \div \frac{23}{40}$.

Give your answer as a mixed number in its simplest form.

Answer(b) [2]

19 The table shows the average monthly temperature ($^{\circ}\text{C}$) for Fairbanks, Alaska.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature ($^{\circ}\text{C}$)	-23.4	-19.8	-11.7	-0.8	9.2	15.4	16.9	13.8	7.5	-5.8	-21.4	-21.8

(a) Find

(i) the difference between the highest and the lowest temperatures,

Answer(a)(i) $^{\circ}\text{C}$ [1]

(ii) the median.

Answer(a)(ii) $^{\circ}\text{C}$ [2]

(b) A month is chosen at random from the table.

Find the probability that its average temperature is below zero.

Answer(b) [1]

- 8 Factorise completely.

$$8w^2x - 12wy$$

Answer [2]

- 9 A cylinder has radius 3.6 cm and height 16 cm.

Calculate the volume of the cylinder.

Answer cm^3 [2]

- 2.10 Cheryl recorded the midday temperatures in Seoul for one week in January.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature ($^{\circ}\text{C}$)	-4	-5	-3	-11	-8	-3	-1

- (a) Write down the mode.

Answer(a) $^{\circ}\text{C}$ [1]

- (b) On how many days was the temperature lower than the mode?

Answer(b) [1]

- 21 The table shows the temperature each night for a week.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
-3°C	1°C	-4°C	-2°C	5°C	3°C	-1°C

- (a) Which night was the coldest?

..... [1]

- (b) Find the difference between the temperature on Monday night and the temperature on Tuesday night.

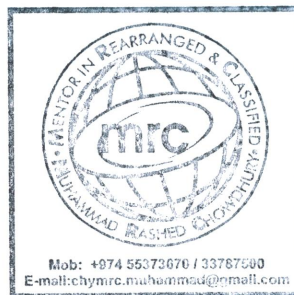
..... $^{\circ}\text{C}$ [1]

- (c) Find the range.

..... $^{\circ}\text{C}$ [1]

- (d) Find the median.

..... $^{\circ}\text{C}$ [1]



The table shows the average monthly temperatures in Beijing.

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22

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temperature (°C)	-4.6	-2.2	4.5	13.1	19.8	24.0	25.8	24.4	19.4	12.4	4.1	-2.7

(a) Work out how many degrees higher the temperature is in December than in January.

Answer(a) °C [1]

(b) Find the range.

Answer(b) °C [1]

6 $\mathbf{a} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$

Work out $3\mathbf{a} + \mathbf{b}$.

Answer $\left(\begin{array}{c} \\ \end{array} \right)$ [2]

7

$$1\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{p}{12}$$

Work out the value of p .

Show all your working.

Answer $p =$ [2]

- 23 (b) Wei records the number of children living in each of the houses in a street. Her results are recorded in the table.

Number of children	Frequency
0	3
1	3
2	8
3	5
4	4
5	2

Calculate the mean number of children per house.

Answer(b) [3]



12 people each solved the same puzzle.
The table shows their ages and the time they each took to solve the puzzle.

Age (years)	19	24	28	16	25	20	15	22	32	30	68	16
Time (seconds)	36	38	42	36	45	42	32	40	40	46	56	38

(a) Find the median age.

Answer(a) years [2]

(b) For these 12 people, explain why the mean age may not be an appropriate average.

Answer(b)

..... [1]

(c) Calculate the mean **time** taken.

Answer(c) seconds [2]

- 16 Fruit juice costs \$1.27 per litre and rice costs \$1.68 per kilogram.

Work out the total cost of 4 litres of fruit juice and 3.5 kilograms of rice.

Answer \$ [3]

- 17 Jason receives some money for his birthday.
He spends $\frac{11}{15}$ of the money and has \$14.40 left.

Calculate how much money he received for his birthday.

Answer \$ [3]

- 25 The table shows information about the numbers of pets owned by 24 students.

25

Number of pets	0	1	2	3	4	5	6
Frequency	1	2	3	5	7	3	3

Calculate the mean number of pets.

Answer [3]

- 26 (a) Colin has some seeds.
The probability a seed will grow is 0.85.

Find the probability that a seed will **not** grow.

Answer(a) [1]

- (b) Richard grows flowers.
Some of his flowers are chosen at random.
The colours are recorded in the table below.

Colour of flower	Frequency	Relative Frequency
Red	20	0.16
Blue	15	
Yellow	35	
Other	55	

- (i) Complete the table to show the relative frequency of each colour. [2]
- (ii) Richard grows 800 flowers in total.
Estimate how many of these flowers are red.

Answer(b)(ii) [2]



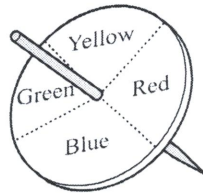
13 (a) Factorise $9y + 12$.

Answer(a) [1]

(b) Expand $a(a^2 - 7)$.

Answer(b) [2]

27 Ying spins a spinner 75 times.
The table shows her results.



Colour	Red	Blue	Green	Yellow
Frequency	17	24	20	14

(a) Write down the relative frequency of the spinner stopping on blue.

Answer(a) [1]

(b) Tony spins the **same** spinner 450 times.

Find the expected number of times the spinner stops on yellow.

Answer(b) [2]

- 28 30 students took a vocabulary test.
The marks they scored are shown below.

7	8	5	8	3	2
6	6	3	3	6	2
7	1	5	10	2	6
6	5	8	1	2	7
3	1	5	3	10	3

- (a) Complete the frequency table below.

The first five frequencies have been completed for you.
You may use the tally column to help you.

Mark	Tally	Frequency
1		3
2		4
3		6
4		0
5		4
6		
7		
8		
9		
10		

[3]

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(b) (i) Find the range.

Answer(b)(i) [1]

(ii) Write down the mode.

Answer(b)(ii) [1]

(iii) Find the median.

Answer(b)(iii) [2]

(iv) Calculate the mean.

Answer(b)(iv) [3]

(c) A student is chosen at random.

Find the probability that the student scored

(i) 1 mark,

Answer(c)(i) [1]

(ii) 4 marks,

Answer(c)(ii) [1]

(iii) fewer than 6 marks.

Answer(c)(iii) [1]

- 29 The total distance, to the nearest kilometre, travelled by a taxi each day for 24 days is shown below.

100	98	95	98	97	99	96	98
97	98	97	99	100	96	97	99
100	250	97	99	98	95	97	96

For
Examiner's
Use

- (a) (i) Complete the frequency table.
You may use the tally column to help you.

Distance travelled (km)	Tally	Number of days
95		
96		
97		
98		
99		
100		
250		

[2]



(ii) Write down the mode.

Answer(a)(ii) km [1]

(iii) Find the median.

Answer(a)(iii) km [2]

(iv) Calculate the mean.

Answer(a)(iv) km [3]

(v) Which of the mean or the median best represents the average distance the taxi travels each day?
Give a reason for your answer.

Answer(a)(v) because
..... [1]

(b) Find the probability that, on a day chosen at random, the taxi travels 98 km or more.

Answer(b) [2]

Denzil grows tomatoes. He selects a random sample of 25 tomatoes. The mass of each tomato, to the nearest 5 grams, is shown below.

55	65	50	75	65
80	70	70	55	60
70	60	65	50	75
65	70	75	80	70
55	65	70	80	55



- (a) (i) Complete the frequency table.
You may use the tally column to help you.

Mass (grams)	Tally	Frequency
50		
55		
60		
65		
70		
75		
80		

[2]

- (ii) Write down the mode.

Answer(a)(ii) g [1]

- (iii) Find the range.

Answer(a)(iii) g [1]

- (iv) Show that the mean mass is 66 g.

Answer(a)(iv)

[2]

- (b) Denzil picks 800 tomatoes.
4% of the 800 tomatoes are damaged.

How many of these tomatoes are **not** damaged?

Answer(b) [2]

- (c) Denzil sells 750 of his tomatoes.

- (i) The mean mass of a tomato is 66 g.

Calculate the mass of the 750 tomatoes in kilograms.

Answer(c)(i) kg [3]

- (ii) Denzil sells his tomatoes at \$1.40 per kilogram.

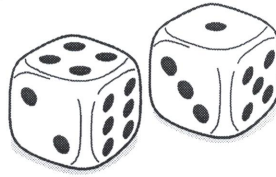
Calculate the total amount he receives from selling all the 750 tomatoes.

Answer(c)(ii) \$ [1]

- (iii) The cost of growing these tomatoes was \$33.

Calculate his percentage profit.

Answer(c)(iii) % [3]



Felix rolls two fair dice, each numbered from 1 to 6, and adds the numbers shown. He repeats the experiment 70 times and records the results in a frequency table.

The first 60 results are shown in the tally column of the table.
The last 10 results are 6, 8, 9, 2, 6, 4, 7, 9, 6, 10.

Total	Tally	Frequency
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

- (a) (i) Complete the frequency table to show all his results. [2]
 (ii) Write down the relative frequency of a total of 5.

Answer(a)(ii) [1]

(b) (i) Write down the mode.

Answer(b)(i) [1]

(ii) Write down the range.

Answer(b)(ii) [1]

(iii) Work out the median.

Answer(b)(iii) [2]

(iv) Calculate the mean.

Answer(b)(iv) [3]

(c) (i) Complete this table showing how different totals can be made when rolling two dice.

		Dice 1					
		1	2	3	4	5	6
Dice 2	1	2	3	4	5	6	7
	2	3	4	5	6		
	3						
	4			7			
	5		7		9		
	6						12

[1]

(ii) Explain why 7 is the most likely total.

Answer(c)(ii) [1]