Cambridge IGCSE

MATHEMATICS

0580 - P3

2020 - 2025

QUESTIONS + ANSWERS

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1 – (0580/31_Summer_2020_Q1) – *Percentages, Ratio And Proportion*

Gabriela designs the seating layout for a new theatre.
There are three sections of seats, A, B and C.

(a) Section A has 152 seats.
Section B has 12.5% more seats than Section A.
Section C has $\frac{3}{8}$ of the number of seats in Section A.

(i) Show that the number of seats in Section B is 171.

[1]

(ii) Show that the total number of seats is 380.

[2]

(b) Write down and simplify the ratio of the number of seats in each section A : B : C.

A : B : C = ... : ..... : ..... [2]

(c) In Section A:

- There are 12 seats in the front row.
- Each row has 2 more seats than the row in front of it.

Work out the number of rows for the 152 seats in Section A.

..... rows [2]

(d) For a concert in the theatre, the ticket prices are in the ratio

$$A : B : C = 9 : 7 : 4.$$

A ticket for Section C costs \$6.

(i) Show that a ticket for Section B costs \$10.50 .

[1]

(ii) Find the cost of a ticket for Section A.

\$ ..... [1]

(iii) The table shows the number of tickets sold in each section.

Section	Number of tickets sold
A	120
B	136
C	30

Calculate the total amount received from the ticket sales.

\$ ..... [3]

(iv) The concert costs \$4500 to organise.

Calculate the amount received from the ticket sales as a percentage of the \$4500.

..... % [1]

2 – (0580/31_Summer_2020_Q5) – *Number Facts*

(a) Using the integers from 60 to 75 only, find

(i) a multiple of 17,

..... [1]

(ii) the prime numbers.

..... [2]

(b) Find

(i) the square root of 4489,

..... [1]

(ii) 4^3,

..... [1]

(iii) $\sqrt[3]{274\,625}$,

..... [1]

(iv) $2^{-3} \times 24^2$.

..... [1]

(c) Write down the reciprocal of 7.

..... [1]

(d) Write 3.72194 correct to 3 decimal places.

..... [1]

(e) Find the lowest common multiple (LCM) of 8 and 14.

..... [2]

(f) The average temperature at the North Pole is −23 °C in January and −11 °C in March.

(i) Find the difference between these temperatures.

..... °C [1]

(ii) The average temperature in July is 28 °C higher than the average temperature in March.

Find the average temperature in July.

..... °C [1]

3 – (0580/32_Summer_2020_Q1) – *Number Facts, Statistics*

(a) Paul has a set of 8 cards, each with a number written on it.
The numbers on the cards are 1, 1, 2, 3, 3, 3, 4, 5.
One card is taken at random.

Write down the probability that the number on the card is

(i) 1,

..... [1]

(ii) an odd number,

..... [1]

(iii) a prime number,

..... [1]

(iv) a number less than 6.

..... [1]

(b) Dina has a set of 12 cards.
These are the numbers on the cards.

3 4 1 3 2 1 3 4 2 2 1 3

Work out

(i) the median,

..... [2]

(ii) the mode,

..... [1]

(iii) the mean,

..... [2]

(iv) the range.

..... [1]

(c) Helena has a different set of cards.
She takes one card at random and records the number shown.
She does this 50 times.
The results are shown in the table.

Number on card	Frequency
1	8
2	11
3	10
4	9
5	12

Calculate the mean of her results.

..... [3]

4 – (0580/32_Summer_2020_Q2) – *Number Facts, Speed,distance And Time, Percentages*

(a) Jeremy goes on holiday.
He parks his car in the airport car park from

10 00 on Tuesday 17 July to 17 00 on Saturday 28 July.

The car park charges are shown below.

Monday to Friday	$14 per day
Saturday and Sunday	$8 per day

Part days are charged as full days

Find the total cost of parking his car.

$ ..... [3]

(b) At the airport, Jeremy buys a ring for $53 and a watch for $65.

Work out how much change he receives from $120.

$ ..... [2]

(c) The plane flies from Melbourne to Tokyo at an average speed of 783 km/h.
The distance from Melbourne to Tokyo is 8352 km.
The plane leaves Melbourne at 09 52 local time.
The local time in Tokyo is 2 hours behind the local time in Melbourne.

Find the local time in Tokyo when the plane arrives.

..... [4]

(d) In Tokyo, Jeremy buys a bracelet for 2050 yen.
The exchange rate is 1 yen = \$0.0125 .

Calculate the price of the bracelet in dollars.
Give your answer correct to the nearest dollar.

\$ ..... [2]

(e) The plane ticket costs \$680 plus a tax of 16%.

Find the total cost of this ticket.

\$ ..... [2]

5 – (0580/32_Summer_2020_Q4) – *Number Facts, Percentages*

Alexa, Ben and Chloe own a restaurant.

(a) Alexa records some temperatures.

Fridge 4 °C Cool box −3 °C Freezer −19 °C

(i) Find the difference in temperature between the fridge and the cool box.

..... °C [1]

(ii) Find the difference in temperature between the cool box and the freezer.

..... °C [1]

(iii) The temperature in the cold room is 5 °C lower than the fridge.

Find the temperature in the cold room.

..... °C [1]

(b) Alexa, Ben and Chloe share the profits from their restaurant in the ratio 2 : 6 : 7.
One year the restaurant makes a profit of $60 000.

Work out how much each receives.

Alexa = $ .....

Ben = $ .....

Chloe = $ ..... [3]

(c) They invest $12 000 at a rate of n% per year simple interest.
At the end of 3 years the value of the investment is $12 900.

Find the value of n.

n = ... [3]

6 – (0580/33_Summer_2020_Q1) – *Percentages, Standard Form*

(a) **(i)** Write down a fraction equivalent to $\frac{1}{15}$.

..... [1]

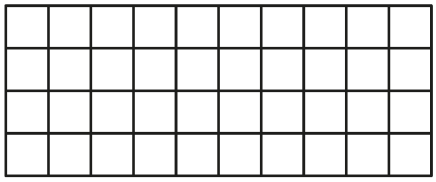
(ii) Find a fraction that is greater than $\frac{1}{15}$ but less than $\frac{2}{15}$.

..... [1]

(b) **(i)** Write 15% as a decimal.

..... [1]

(ii) Shade 15% of this grid.



[1]

(c) Write down all the factors of 15.

..... [2]

(d) Find the value of $\sqrt{15}$.
Give your answer correct to 3 decimal places.

..... [2]

(e) **(i)** Write down the reciprocal of 15.

..... [1]

(ii) Write down the value of 15^0.

..... [1]

(iii) Write 0.015 in standard form.

..... [1]

ANSWERS

1 – (0580/31_Summer_2020_Q1) – *Percentages, Ratio And Proportion*

(a)(i)	$112.5 \div 100 \times 152$ oe	**1**	
(a)(ii)	$3 \div 8 \times 152 + 152 + 171$	**2**	**B1** for $3 \div 8 \times 152$
(b)	8 : 9 : 3	**2**	**B1** for 152 : 171 : 57
(c)	8	**2**	**M1** for correct attempt e.g. 12 + 14 + 16 ….
(d)(i)	$6 \div 4 \times 7$	**1**	
(d)(ii)	13.50	**1**	
(d)(iii)	3228	**3**	**FT** *their* **(d)(ii)** **M2** for $120 \times$ *their* **(d)(ii)** $+ 136 \times 10.5 + 30 \times 6$ or **B1** for *their* 1620 or 1428 or 180
(d)(iv)	71.7 or 71.7[3.....]	**1**	**FT** *their* **(d)(iii)**

2 – (0580/31_Summer_2020_Q5) – *Number Facts*

(a)(i)	68	**1**	
(a)(ii)	61, 67, 71, 73	**2**	**B1** for 3 correct and none incorrect or 4 correct and one incorrect
(b)(i)	67	**1**	
(b)(ii)	64	**1**	
(b)(iii)	65	**1**	
(b)(iv)	72	**1**	
(c)	$\frac{1}{7}$	**1**	
(d)	3.722	**1**	
(e)	56	**2**	**B1** for $56k$ or lists of multiples of 8 and 14 (at least 3 of each)
(f)(i)	12	**1**	
(f)(ii)	17	**1**	

3 – (0580/32_Summer_2020_Q1) – *Number Facts, Statistics*

(a)(i)	$\frac{1}{4}$ oe	**1**	
(a)(ii)	$\frac{3}{4}$ oe	**1**	
(a)(iii)	$\frac{5}{8}$	**1**	
(a)(iv)	1	**1**	
(b)(i)	2.5	**2**	**M1** for ordering the numbers to the middle two e.g. 1 1 1 2 2 2 3 or 2 3 3 3 3 4 4 or **B1** for 2 and 3 identified
(b)(ii)	3	**1**	
(b)(iii)	2.42 or 2.416 to 2.417 or $2\frac{5}{12}$	**2**	**M1** for (1 + 1 + 1 + 2 + 2 + 2 + 3 + 3 + 3 + 3 + 4 + 4) ÷ 12
(b)(iv)	3	**1**	
(c)	3.12	**3**	**M1** for $1 \times 8 + 2 \times 11 + 3 \times 10 + 4 \times 9 + 5 \times 12$ soi 156 **M1dep** for *their* 156 ÷ 50

4 – (0580/32_Summer_2020_Q2) – *Number Facts, Speed,distance And Time, Percentages*

(a)	150	**3**	**M2** for $9 \times 14 + 3 \times 8$ oe or **M1** for 9×14 or 3×8 oe
(b)	2	**2**	**M1** for 120 – (53 + 65) oe
(c)	18 32	**4**	**M1** for 8352 ÷ 783 **A1** for 10 h 40 min **M1** for the correct adjustment of the 2 hours
(d)	26	**2**	**M1** for 2050×0.0125 soi 25.625
(e)	788.8[0]	**2**	**M1** for $680 \times (1+\frac{16}{100})$ oe

5 – (0580/32_Summer_2020_Q4) – *Number Facts, Percentages*

(a)(i)	7	**1**	
(a)(ii)	16	**1**	
(a)(iii)	−1	**1**	
(b)	8000 24000 28000	**3**	**B2** for one correct or **M2** for $\frac{60000}{2+6+7} \times k$ or **M1** for $\frac{60000}{2+6+7}$
(c)	2.5	**3**	**M1** for $\frac{12900-12000}{3}$ **M1dep** for $\frac{their\ 300}{12000}$ [$\times 100$]

6 – (0580/33_Summer_2020_Q1) – *Percentages, Standard Form*

(a)(i)	$\frac{k}{15k}$ cao	**1**	
(a)(ii)	$\frac{a}{b}$, where $\frac{1}{15} < \frac{a}{b} < \frac{2}{15}$	**1**	
(b)(i)	0.15 cao	**1**	
(b)(ii)	6 squares shaded	**1**	
(c)	1, 3, 5, 15	**2**	**B1** for 3 correct and no extras or 4 correct and one extra
(d)	3.873 cao	**2**	**B1** for 3.87 or 3.872...
(e)(i)	$\frac{1}{15}$	**1**	
(e)(ii)	1	**1**	
(e)(iii)	1.5×10^{-2} cao	**1**	