

# CAMBRIDGE

Assessment International Education

## IGCSE 0580

# MATHEMATICS

## Paper (

Classified in % Topics

Unsolved with Mark Scheme

Questions Order from New to Old

From 2016 to 2022 & all variants

## H5G@99A ? < 5LI8

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Book Title: IGCSE Mathematics Extended **Paper 4** Topical with Mark Scheme

Format: Topical (0580/4 All Variants)

Published by: STUDENTS RESOURCE® Airport Road 0423-5700707

Edition: 2021-22

Price: ~~Rs 1000/-~~

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## CONTENT

Topic 1	Everyday Mathematics.....	04
	Mark Scheme.....	79
Topic 2	Algebra.....	108
	Mark Scheme.....	174
Topic 3	Mensuration.....	206
	Mark Scheme.....	282
Topic 4	Angles and Circles Properties.....	312
	Mark Scheme.....	343
Topic 5	Loci.....	354
	Mark Scheme.....	357
Topic 6	Indices.....	359
	Mark Scheme.....	363
Topic 7	Inequalities and Their Graph.....	365
	Mark Scheme.....	375
Topic 8	Trigonometry and Bearings.....	379
	Mark Scheme.....	432
Topic 9	Graphs and Their Solution.....	448
	Mark Scheme.....	516
Topic 10	Sets .....	540
	Mark Scheme.....	550
Topic 11	Matrices.....	554
	Mark Scheme.....	558
Topic 12	Vectors.....	560
	Mark Scheme.....	584
Topic 13	Functions.....	593
	Mark Scheme.....	618
Topic 14	Coordinate Geometry.....	629
	Mark Scheme.....	646
Topic 15	Transformation.....	652
	Mark Scheme.....	684
Topic 16	Probability.....	694
	Mark Scheme.....	720
Topic 17	Statistics.....	730
	Mark Scheme.....	798
Topic 18	Investigation, Practical Problems and Puzzles.....	823
	Mark Scheme.....	846

# Topic 1 Everyday Mathematics

1 0580/43/O/N/22/Q1

(a) Here are the ingredients needed to make a pasta bake to serve 12 people.

250 g butter
600 g pasta
460 g mushrooms
280 g cheese
800 ml milk

(i) Find the mass of the cheese as a percentage of the mass of the mushrooms.

..... % [1]

(ii) Find the mass of butter needed to make a pasta bake to serve 18 people.

..... g [2]

(iii) Monica has 2.2 litres of milk and 1.5 kg of each other ingredient.

Calculate the greatest number of people she can serve with pasta bake.

..... [3]

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- (b) In 2019, a packet of pasta cost \$2.40.  
This was an increase of 25% of the cost of a packet in 2018.

(i) Work out the cost in 2018.

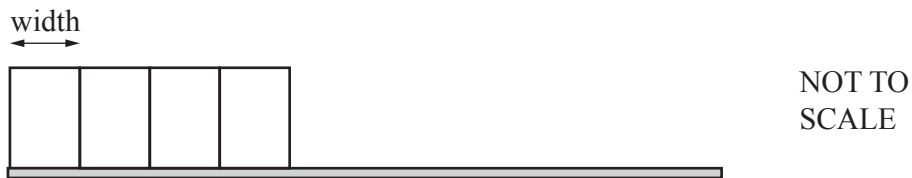
\$ ..... [2]

(ii) In 2020, the cost of a packet increased by 15% from the cost in 2019.

Work out the total percentage increase in the cost of a packet from 2018 to 2020.

.....% [3]

(c)



Pasta is sold in packets with width 11.5 cm, correct to the nearest 0.5 cm.  
A shop places these packets in a single line on a shelf of length 2 m, correct to the nearest 0.1 m.

Find the maximum number of these packets that will fit along this shelf.  
You must show all your working.

..... [3]

2 0580/42/O/N/22/Q1

- (a) (i) At a football club, season tickets are sold for seated areas and for standing areas.

The cost of season tickets are in the ratio seated : standing = 5 : 3.

The cost of a season ticket for the standing area is \$45.

Find the cost of a season ticket for the seated area.

\$ ..... [2]

- (ii) In 2021, the value of the team's players was \$2.65 million.  
In 2022 this value has decreased by 12%.

Find the value in 2022.

\$ ..... million [2]

- (iii) The number of people at a football match is 1455.  
This is 6.25% of the total number of people allowed in the stadium.

Find the total number of people allowed in the stadium.

..... [2]

- (iv) The average attendance increased exponentially by 4% each year for the three years from 2016 to 2019.  
In 2019 the average attendance was 1631.

Find the average attendance for 2016.

..... [3]

- (b) Another club sells season tickets for individuals and for families.  
 In 2018, the number of season tickets sold is in the ratio family : individual = 2 : 7.
- (i) The number of family season tickets sold is  $x$ .

Write an expression, in terms of  $x$ , for the number of individual season tickets sold.

..... [1]

- (ii) In 2019, the number of family season tickets sold increases by 12 and the number of individual season tickets sold decreases by 26.

Complete the table by writing expressions, in terms of  $x$ , for the number of tickets sold each year.

Year	Family tickets	Individual tickets
2018	$x$	
2019		

[2]

- (iii) In 2019, the number of individual season tickets sold is 3 times the number of family season tickets sold.

Write an equation in  $x$  and solve it to find the number of family tickets sold in 2018.

$x =$  ..... [4]

3 0580/41/O/N/22/Q4

- (a) (i) Zak invests \$500 at a rate of 2% per year simple interest.

Calculate the value of Zak's investment at the end of 5 years.

\$ ..... [3]

- (ii) Yasmin invests \$500 at a rate of 1.8% per year compound interest.

Calculate the value of Yasmin's investment at the end of 5 years.

\$ ..... [2]

- (iii) Zak and Yasmin continue with these investments.

How many **more complete** years is it before the value of Yasmin's investment is greater than the value of Zak's investment?

..... [3]



- (b) Xavier buys a car for \$2500.  
The value of the car decreases exponentially at a rate of 10% each year.

Calculate the value of Xavier's car at the end of 5 years.  
Give your answer correct to the nearest dollar.

\$ ..... [3]

- (c) The number of a certain type of bacteria increases exponentially at a rate of  $r\%$  each day.  
After 22 days, the number of this bacteria has doubled.

Find the value of  $r$ .

$r =$  ..... [3]

4 0580/41/O/N/22/Q2

(a) Write

(i) 2994.99 correct to the nearest 10,

..... [1]

(ii) 0.983 correct to 1 decimal place,

..... [1]

(iii) 2090 correct to 2 significant figures.

..... [1]

(b) Write down a prime number between 90 and 100.

..... [1]

(c) Write  $2^{-6}$  as a fraction.

..... [1]

(d) Write 0.00701 in standard form.

..... [1]

(e) Simplify  $1.5 \times 10^x + 1.5 \times 10^{x-1}$  giving your answer in standard form.

..... [2]

(f) Write  $0.3\dot{7}$  as a fraction.  
You must show all your working.

..... [2]

5 0580/43/M/J/22/Q3

- (a) The table shows the numbers of tigers reported to be living in the wild in the year 2014 in some countries.

Country	Number
India	2226
Indonesia	371
Nepal	198
Bangladesh	106

- (i) Using the table,

- (a) find the number of tigers in Nepal as a percentage of the number of tigers in Bangladesh,

..... % [1]

- (b) find the ratio tigers in Bangladesh : tigers in Indonesia : tigers in India, giving your answer in its simplest form.

..... : ..... : ..... [2]

- (ii) Five years later, the number of tigers reported in India was 2967.

Find the percentage increase in the population of tigers in India.

..... % [2]

- (iii) The number of tigers in India in the year 2014 is approximately 30.48% greater than in the year 2010.

Find the number of tigers in India in the year 2010.

Give your answer correct to the nearest integer.

..... [3]

- (b) At the start of June, a hive has a population of 2000 bees.  
Three months after the start of June the hive has a population of 2662 bees.

The population of this hive can be calculated using the formula

$$P = ab^x,$$

where  $P$  is the population of the hive  $x$  months after the start of June.

By finding the value of  $a$  and the value of  $b$ , calculate the population of the hive 7 months after the start of June.

Give your answer correct to the nearest integer.

..... [5]

6 0580/43/M/J/22/Q1

Here is part of a bus timetable.

Abbots	06 50	08 25	09 20
Callet	07 12	08 47	09 42
North Moor	07 30	09 05	10 00
South Moor	07 37	09 12	10 07
Centre Point	08 00	09 35	10 30

- (a) Rashid catches the 09 20 bus at Abbots.

Find the time the bus arrives at South Moor.

..... [1]

- (b) Annisa leaves home at 8.27 am and takes 25 minutes to walk to the bus stop at Callet.  
She catches the next bus to Centre Point.

Find the total time, in minutes, for her journey from leaving home to arriving at Centre Point.

..... min [2]

- (c) The distance from Abbots to Centre Point is 29.4 km.  
Each bus takes the same time for the journey.

Calculate the average speed of a bus for this journey.  
Give your answer in kilometres per hour.

..... km/h [2]

- (d) On one journey, all 56 seats on the bus are filled.  
The ratio of adults to children on this journey is adults : children = 5 : 3.  
The cost for an adult ticket is \$2.80 .  
The cost for a child ticket is  $\frac{3}{4}$  of the adult cost.

Work out the total cost of the tickets for this journey.

\$ ..... [4]

7 0580/42/M/J/22/Q6

- (a) At a festival, 380 people out of 500 people questioned say that they are camping.

There are 55 300 people at the festival.

Calculate an estimate of the total number of people camping at the festival.

..... [2]

- (b) 12 friends travel to the festival.  
5 travel by car, 4 travel by bus and 3 travel by train.  
Two people are chosen at random from the 12 friends.

Calculate the probability that they travel by different types of transport.

..... [4]

- (c) Arno buys a student ticket for \$43.68 .  
This is a saving of 16% on the full price of a ticket.

Calculate the full price of a ticket.

\$ ..... [2]

(d) At a football match, there are 29 800 people, correct to the nearest 100.

(i) At the end of the football match, the people leave at a rate of 400 people per minute, correct to the nearest 50 people.

Calculate the lower bound for the number of minutes it takes for all the people to leave.

..... min [3]

(ii) At a cricket match there are 27 500 people, correct to the nearest 100.

Calculate the upper bound for the difference between the number of people at the football match and at the cricket match.

..... [2]

8 0580/42/M/J/22/Q1

- (a) Find the lowest common multiple (LCM) of 30 and 75.

..... [2]

- (b) Share \$608 in the ratio 4 : 5 : 7.

\$ .....

\$ .....

\$ ..... [3]

- (c) Work out  $\frac{6.39 \times 10^4}{2.45 \times 10^6}$ .

Give your answer in standard form.

..... [2]

- (d) Write  $0.\dot{2}\dot{7}$  as a fraction.

..... [1]

- (e) A stone has volume  $45 \text{ cm}^3$  and mass 126 g.  
Find the density of the stone, giving the units of your answer.

[Density = mass  $\div$  volume]

..... [2]



9 0580/41/M/J/22/Q2

- " (a) Alex, Bobbie and Chris share strawberries in the ratio Alex : Bobbie : Chris = 3 : 2 : 2.

Chris receives 12 strawberries.

Calculate the total number of strawberries shared.

..... [2]

- (b) In a sale, a shop reduces all prices by 12%.

- (i) Dina buys a book which has an original price of \$6.50 .

Calculate how much Dina pays for the book.

\$ ..... [2]

- (ii) Elu pays \$11 for a toy.

Calculate the original price of the toy.

\$ ..... [2]

- (c) Feri invests some money.

The rate of interest for the first year is 2.5%.

At the end of the second year the overall percentage increase of Feri's investment is 6.6%.

Find the rate of interest for the second year.

..... % [2]

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- (d) A radioactive substance decays at an exponential rate of 2% per day.  
The initial mass is 80 g.

- (i) Find the mass at the end of 5 days.

..... g [2]

- (ii) Find how many **more** whole days, after day 5, it takes for the mass to reduce to less than 67 g.

..... [3]

10 0580/42/F/M/22/Q8

Darpan runs a distance of 12 km and then cycles a distance of 26 km.

His running speed is  $x$  km/h and his cycling speed is 10 km/h faster than his running speed.

He takes a total time of 2 hours 48 minutes.

- (a) An expression for the time, in hours, Darpan takes to run the 12 km is  $\frac{12}{x}$ .

Write an equation, in terms of  $x$ , for the total time he takes in hours.

..... [3]

- (b) Show that this equation simplifies to  $7x^2 - 25x - 300 = 0$ .

[4]

- (c) Use the quadratic formula to solve  $7x^2 - 25x - 300 = 0$ .  
You must show all your working.

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [4]

- (d) Calculate the number of minutes Darpan takes to run the 12 km.

..... min [2]

11 0580/42/F/M/22/Q1

A company employed 300 workers when it started and now employs 852 workers.

- (a) Calculate the percentage increase in the number of workers.

..... % [2]

- (b) Of the 852 workers, the ratio part-time workers : full-time workers = 5 : 7.

Calculate the number of full-time workers.

..... [2]

- (c) The company makes 40 600 headphones in one year.

Write this number

- (i) in words,

..... [1]

- (ii) in standard form.

..... [1]

- (d) In one month, the company sells 3 000 headphones.

Of these, 48% are exported,  $\frac{3}{8}$  are sold to shops and the rest are sold online.

Calculate the number of headphones that are sold online.

..... [3]

STUDENTS RESOURCE

- (e) One year, sales increased by 15%.  
The following year sales increased by 18%.

Calculate the overall percentage increase in sales.

..... % [3]

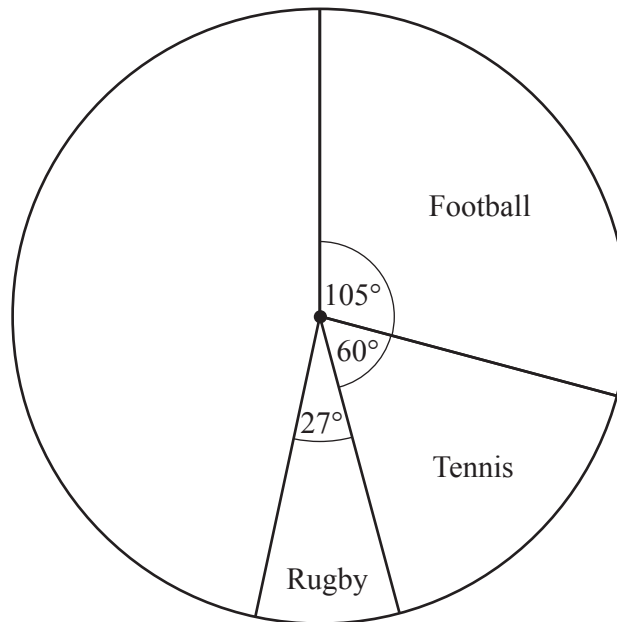
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STUDENTS RESOURCE

12 0580/43/O/N/21/Q8

(a) Jean asks 600 people to choose their favourite sport.

The pie chart shows some of this information.



(i) Show that 100 people choose tennis.

[1]

(ii) Work out how many people choose rugby.

..... [2]

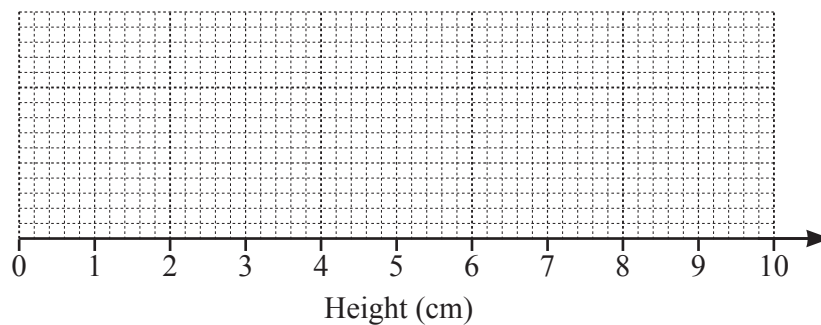
(iii) 125 people choose cricket and the rest choose swimming.  
Complete the pie chart to show this information.

[2]

(b) The heights of some plants are measured:

- smallest height = 0.6 cm
- range = 8.1 cm
- median = 5.2 cm
- lower quartile = 3.4 cm
- interquartile range = 4.1 cm.

On the grid, draw a box-and-whisker plot to show this information.



[3]

13 0580/43/O/N/21/Q7

- (a) Amir buys 3 cakes that cost  $c$  cents each and 2 loaves of bread that cost  $(2c - 11)$  cents each. He spends a total of \$5.87.

Find the value of  $c$ .

$$c = \dots\dots\dots [3]$$

- (b) A bottle of water costs \$ $w$ .  
A bottle of juice costs \$ $(w + 1)$ .

Alex spends \$22 on bottles of water and \$42 on bottles of juice.  
The number of bottles of water is equal to the number of bottles of juice.

Find the value of  $w$ .

$$w = \dots\dots\dots [3]$$

- (c) Alicia walks a distance of 9 km at a speed of  $x$  km/h.

She then runs a distance of 5 km at a speed of  $(2x + 1)$  km/h.

The total time Alicia takes is 2.5 hours.

- (i) Show that  $10x^2 - 41x - 18 = 0$ .

[4]

- (ii) Work out Alicia's running speed.  
You must show all your working.

..... km/h [4]



14 0580/43/O/N/21/Q5

- (a) \$500 is invested at a rate of 3% per year.

Calculate the total interest earned at the end of 7 years when

- (i) simple interest is paid,

\$ ..... [2]

- (ii) compound interest is paid.

\$ ..... [3]

- (b) The value of a car decreases exponentially by 10% each year.  
The value now is \$6269.40 .

Calculate the value of the car 3 years ago.

\$ ..... [3]