

O-Level Mathematics

Paper 2

Unsolved Topical

Past Papers With Marking Scheme
According to New Syllabus (2023-2025)

2014-2021

All rights reserved. No part of this publication may be reproduced, Stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher.

Title O-LEVEL Mathematics Paper 2

Published by MS Books (042-35774780)

Legal Advisor Ashir Najeeb Khan (Advocate)
AKBAR LAW CHAMBERS
39-40, 1st Floor, Sadiq Plaza, The Mall, Lahore.
0307-4299886, 042-36314839

For Complaints/Order **MS Books**
83-B Ghalib Market Gulberg III Lahore
info@msbooks.pk
(042-35774780), (03334504507), (03334548651)

PREFACE

Excellence in learning cannot be claimed without application of concepts in a dexterous way. In this regard one of the logical approach is to start in chunks; like chapter wise learning and applying the concept on exam based questions.

This booklet provides an opportunity to candidates to practice topic wise questions from previous years to the latest. Extensive working of Team MS Books has tried to take this booklet to perfection by collaborating with top of the line teachers.

We have added answer key / marks scheme at the end of each topic for the candidate to compare the his/her answer to the best.

MS Books strives to maintain actual spacing between consecutive questions and within options as per CAIE format which gives students a more realistic feel of attempting question.

Review, feedback and contribution in this booklet by various competent teachers of a subject belonging to renowned school chains make it most valuable resource and tool for both teachers and students.

With all belief in strength of this resource material I can confidently claim that it is worth in achieving brilliance.

Our sincere thanks and gratification to **Mr.Zafar Iqbal** who took out special time to help compile and manage this booklet. We would also like to appreciate Mathematics faculty for reviewing and indorsing it.

REVIEWED & RECOMMENDED BY

ZAFAR IQBAL

LGS (Paragon & Cantt)
0300-4215301

IRFAN ZAKA

0311-1888466

ZAIN AFFAQ

LGS Ph-5 & 1A1, BSS (JT)
0323-4151470

ZULFIQAR ALI

SICAS (Gulberg & DHA), ROOTS,
The City School, UCL
0300-9473467

MUHAMMAD KALEEM BUTT

LGS, LACAS, BRICK, LSL, Crescent
0300-9420223

SAIF CHEEMA

LGS (JT & Paragon), BDC
0300-4107763

AQEEL HAIDER

LGS 55 Main, LACAS, BSS
0322-8444787

TABLE OF CONTENT

PAPER 2

S.#	Topic	Pg #
1.	EVERYDAY MATHS <ul style="list-style-type: none"> • Ratio, Proportion, Rate • Percentages • Time • Directed Numbers 	7
2.	C.P/S.P AND S.I <ul style="list-style-type: none"> • Ratio, Proportion, Rate • Personal and Small Business Finance 	23
3.	ALGEBRIC EXPRESSION AND MANIPULATION <ul style="list-style-type: none"> • Algebraic Representation & Formulae • Algebraic Manipulation • Indices & Standard Form 	53
4.	SOLUTIONS OF EQUATIONS & SIMULTANEOUS EQUATIONS	76
5.	SYMMETRIES <ul style="list-style-type: none"> • Symmetry • Angles • Angles & Circle Properties • Angle Properties of Polygons 	120
6.	SIMILARITY AND CONGRUENCY	150
7.	MENSURATION	158
8.	CO-ORDINATE GEOMETRY <ul style="list-style-type: none"> • Lines 	220
9.	GRAPHS IN PRACTICAL SITUATION	233
10.	FUNCTIONS	238
11.	GRAPHS OF FUNCTIONS & GRAPHICAL SOLUTIONS	246
12.	INEQUALITIES <ul style="list-style-type: none"> • Solutions of Equations & Inequalities • Graphical Representation of Inequalities 	298
13.	LOCI AND CONSTRUCTION <ul style="list-style-type: none"> • Locus 	304
14.	MATRICES	326
15.	SETS, VENN'S DIAGRAM <ul style="list-style-type: none"> • Set language & Notation 	336
16.	PROBABILITIES <ul style="list-style-type: none"> • Probability • Statistical Diagrams • Statistics, Pie Chart, Histogram • Categorical, Numerical & Grouped Data • Mean Median Mode 	350

17.	VECTORS	405
	• Vectors in two Dimensions	
18.	TRIGONOMETRY & BEARINGS	430
19.	PATTERNS	496
	• Sequences	
20.	TRANSFORMATION	511
21.	SCATTER DIAGRAM	541

Everyday Maths

Q2/21/O/N/14

1 Hendrik travels by plane from London to Bangkok.
When it is 04:00 local time in London it is 10:00 local time in Bangkok.

(a) The flight takes 11 hours and 15 minutes.

If he leaves London at 21:50 local time, what is the local time in Bangkok when he arrives?

Answer [2]

(b) On his return journey, Hendrik leaves Bangkok at 07:45 local time and arrives back in London on the same day at 13:40 local time.

How long was his return flight?

Answer hours minutes [2]

(c) The graph opposite shows the exchange rate between British Pounds (£) and Thai Baht (THB) on the day Hendrik arrives in Bangkok.

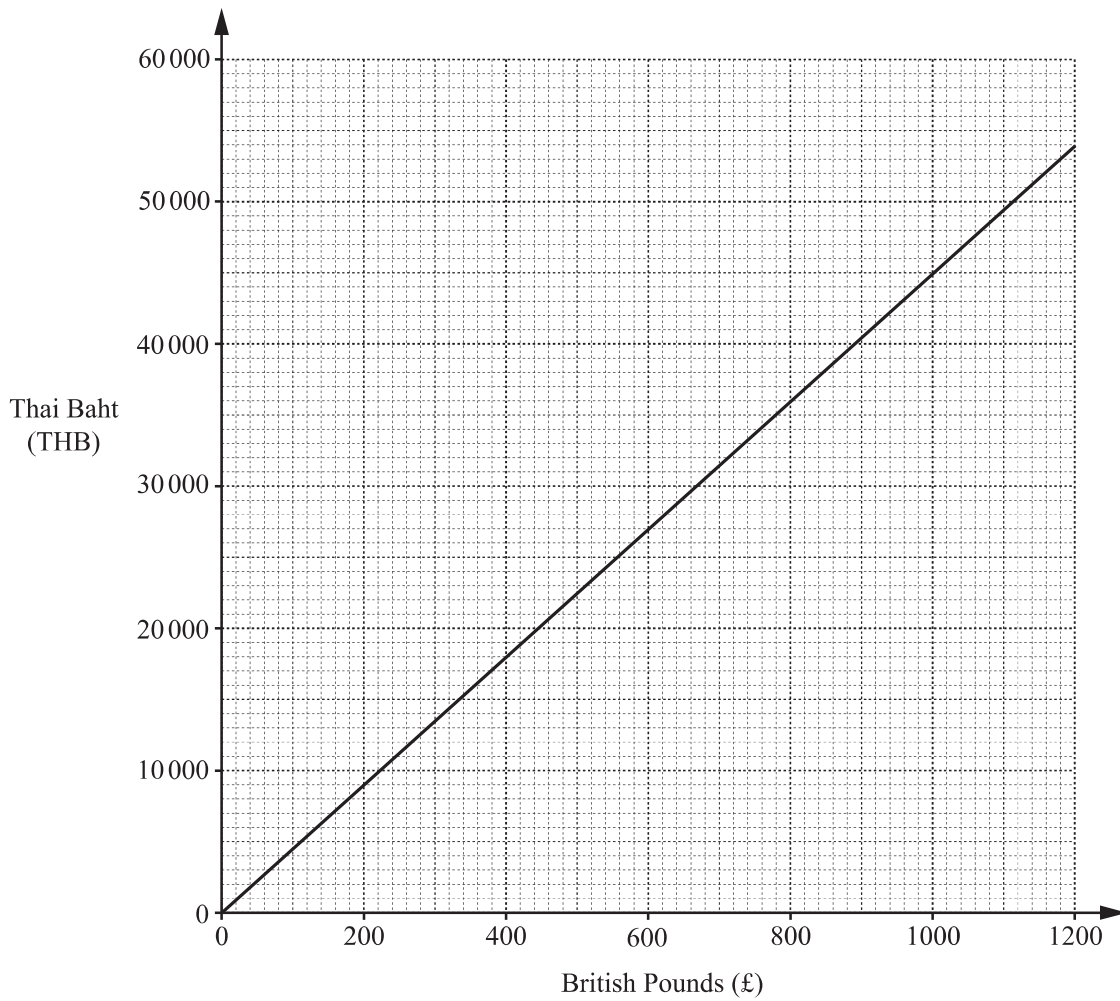
(i) Use the graph to estimate the cost in British Pounds of an item costing 13 000 THB.

Answer £ [1]

(ii) The exchange rate can be written as £1 = k THB.

Find k .

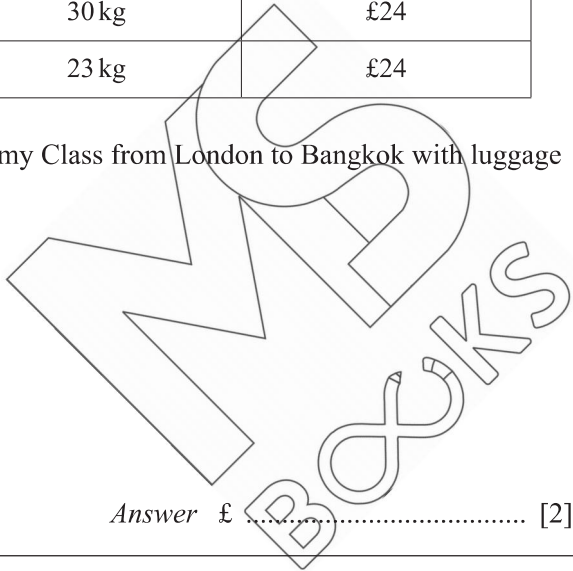
Answer [1]



- (d) The cost of flights from London to Bangkok is shown in the table below. For this cost, passengers are allowed to take luggage up to the weight shown. Passengers taking more than this weight of luggage pay an excess charge at the rate shown.

	Cost of flight	Weight of luggage included	Charge per extra 1 kg
Business Class	£1932	30 kg	£24
Economy Class	£683	23 kg	£24

Calculate the total cost of Hendrik flying Economy Class from London to Bangkok with luggage weighing 29 kg.



Answer £ [2]

Q1/22/O/N/14

2 (a) In 2013, Mary worked for Company A.
Her salary for the year was \$18 750.

(i) \$5625 of her salary was not taxed.

What percentage of her salary was not taxed?

Answer % [2]

(ii) The remaining \$13 125 of Mary’s salary was taxed.
22% of this amount was deducted for tax.
Mary’s take-home pay was the amount remaining from \$18 750 after tax had been deducted.
She received this in 52 equal amounts as a weekly wage.

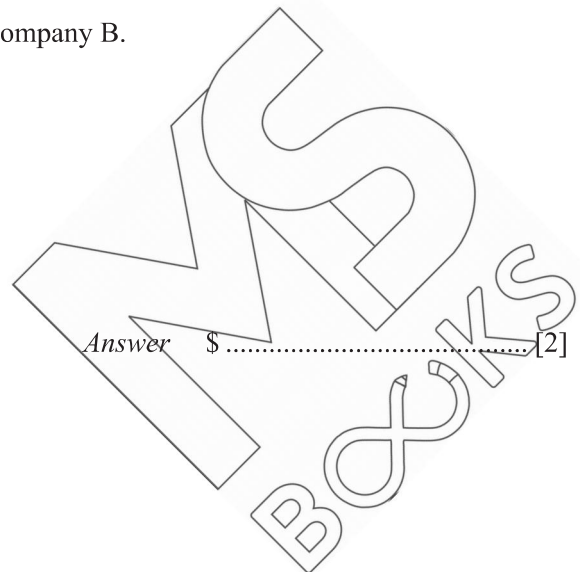
Calculate Mary’s weekly wage.

Answer \$ [3]

(iii) In 2012 Mary had worked for Company B.
When she moved from Company B to Company A, her salary increased by 25% to \$18 750.

Calculate her salary when she worked for Company B.

Answer \$ [2]



(b) The rate of exchange between pounds (£) and Indian rupees (R) is £1 = R87.21.
The rate of exchange between pounds (£) and Swiss francs (F) is £1 = F1.53.

(i) Mavis changed £750 into Indian rupees. How many rupees did she receive?

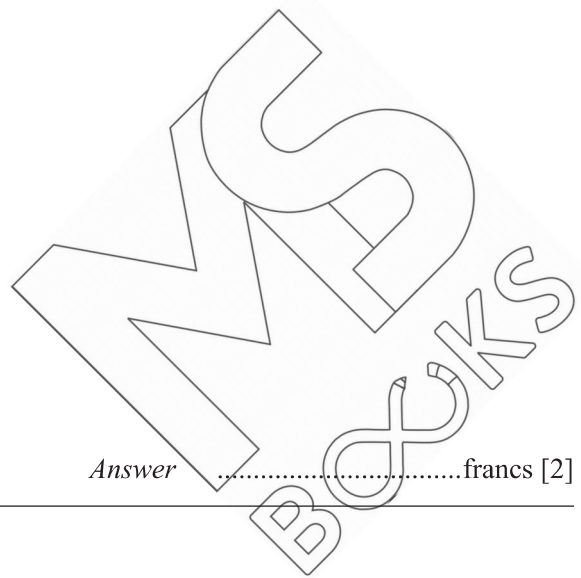
Answer rupees [1]

(ii) David changed F450 into pounds. How many pounds did he receive?

Answer £ [1]

(iii) Brian changed R50 000 into Swiss francs. How many Swiss francs did he receive?

Answerfrancs [2]



Q6/22/M/J/15

- 3 (a) Yuvraj and Sachin travel to England.
Yuvraj exchanges 20 500 rupees and receives £250.
Sachin exchanges 26 650 rupees into pounds (£) at the same exchange rate.

How many pounds does Sachin receive?

Answer £ [2]

- (b) Dan goes to a bank to exchange some pounds (£) for euros (€).
He has £400 which he wants to exchange.
The bank only gives euros in multiples of 5 euros.
The exchange rate is $£1 = €1.17$.

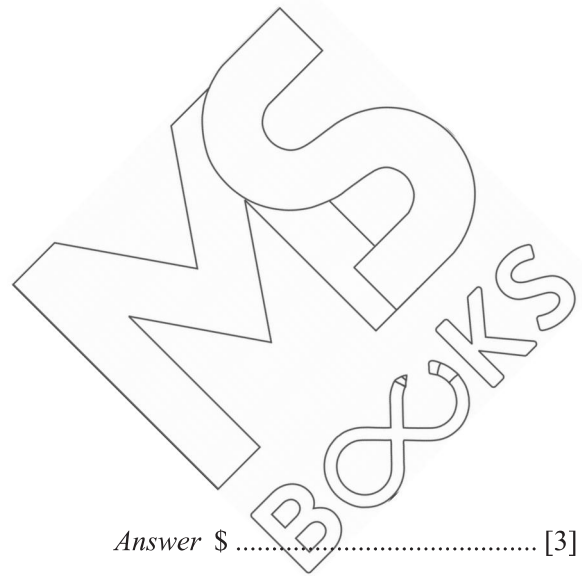
Find the number of euros he receives and his change from £400.

Answer Dan receives €.....

His change is £..... [3]

- (c) Kristianne buys a fridge and a freezer in a sale.
The sale offers 15% off everything and she pays a total of \$357.
Before the sale, the freezer cost \$250.

What was the cost of the fridge before the sale?



Answer \$ [3]

Q2/21/O/N/14

Question 1

Answers: (a) 15 05; (b) 11 hours 55 minutes; (c)(i) 290; (ii) 45; (d) 827.

Q1/22/O/N/14

Question 2

Answers: (a)(i) 30; (ii) 305.05; (iii) 15 000; (b)(i) 65 407.50; (ii) 294.12; (iii) 877.19.

Q6/22/M/J/15

Question 3

(a) 325 (b) 465 and 2.56 to 2.57 (c) 170

Question 4

Answers: (a) 4 : 2 : 3 (b) $c = 14, v = 2, t = 13$

Q1/22/M/J/17

Question 5

Answers: (a) 9370 (b) Bonus cars by \$67

Q2/22/M/J/17

Question 6

Answers: (a) 138 404 000 (b) Thailand (c) 4.9512×10^7 (d) 1.64 (e) 15 400 000

Q1/22/M/J/19 **Q 7**

1(a) 83[.00]

1(b)(i) 15

1(b)(ii) 9.4[0] or 9.397 to 9.398

1(c)(i) 5 (hours) 35 (minutes) cao

1(c)(ii) 140

Q1/21/O/N/19 **Q 8**

1(a) 16

1(b) No, maximum possible mass is 23.25 kg

1(c) 72[.00] final answer

1(d) 36.44

1(e) 115 805
32.75 131
 936
 996.84

Q1/22/O/N/19 **Q 9**

1(a) 2356 1(b) 14 1(c) 375 1(d) 601.75 or 601.76

Q1/22/M/J/21 **Q 10**

1(a) 66.3[0] 1(b) 30.6[0] 1(c) Pietro and 5.48 or 5.49

