St. Patrick's High School, Keady

Mathematics Department

GCSE Mathematics Practice Booklet

M3

Topic 4 – Number 2

Working with Money, Percentages, Fractions and Decimals

Questions taken from CCEA Past Papers

Mark Scheme included at the end of this booklet

Q1 3.2 metres of electrical cable and 0.6 metres of copper wire cost a total of £4.07

The electrical cable costs 85p per metre.

How much does the copper wire cost per metre?

Show clearly all your working.

Answer £ _____ per metre [4]

Q2 A company makes 500 rag dolls.
It costs £3.14 to make each rag doll.
25% of the rag dolls are given to a local charity.
Of the rest, four-fifths are sold for the full price of £5
The remainder are then sold at half-price.
How much profit does the company make?

Answer £ _____ [6]

Q3 The price of a coat in a shop is £129
Pat has £100 but he has also a discount card which allows him 20% off the shop price.
Does he have enough money to buy the coat using his discount card?
You must show working to explain your answer.

[3]

Q4 The total cost of 4 kg of pears and 3 kg of bananas is £14.55
Pears cost £2.55 per kg.
Work out the cost of 1 kg of bananas.

Answer £ _____ [4]

Q5 How many cartons of milk costing £1.28 each can be bought for £10?

Show all your working.

Answer _____ [2]

Q6 A smartphone costs £375

Jill pays a deposit of £95 for this smartphone.

She then pays £35 each month.

How many months will it take before she has paid for the smartphone?

Show your working clearly.

Answer _____ months [3]

Q7 Joanne is having a party. She needs forty packets of crisps.
A single packet of crisps costs 30 pence in each of two local stores.
Each store has a special offer on packets of crisps.

Bargain Store	Discount Store
20% off	buy 3 and get
every ten packets	one more free

Which is better value?

Show your working clearly.

Answer _____ [4]

Q8 Electricity readings from a bill are shown below.

Previous	Present
93449	94969

(a) Calculate the number of units used.

Answer _____ [1]

(b) The cost of each unit is £0.1455
VAT is charged at 5%
Calculate the total electricity bill.

Answer £ _____ [3]

Q9 Tom works 30 hours each week.
He earns £9.50 per hour.
He saves one-fifth of his earnings each week.
He wants to buy a guitar costing £840
How many weeks does it take Tom to save enough to buy the guitar?
You must show all your working.

Answer _____ weeks [5]

Q10 The cost of 43 litres of petrol is £59.77
Work out the cost of one litre of petrol.

Answer £ _____ [2]

Q11 Complete the spaces **(a)**, **(b)**, **(c)** and **(d)** on the electricity bill.

Northern Electricity					
	Meter Reading				
Date	Current units	Previous units	Units used	Price per unit	Total (£)
30 June	43458	42763	**(a)**	15 pence	**(b)** £
				VAT @ 5%	**(c)** £
				Total Charge	**(d)** £

[5]

Q12 Kelly has the following coins in her purse:

one £1 coin
three 50 pence coins
three 20 pence coins
four 10 pence coins

(a) She buys sweets costing £2.24

How much has she left in her purse after paying for the sweets, using the coins?

Answer £ _____ [2]

(b) Kelly wants to have the **least** number of coins in her purse after receiving her change. How should she pay for her sweets and how many coins will she have left?

Show clearly all your working.

[3]

Q13 A television costs £270 plus VAT.

VAT is charged at 20%.

Calculate the VAT charged.

Answer £ _____ [2]

Q14 A shopkeeper ordered 1200 Easter eggs at a cost price of £2.40 each.
Before Easter he sold some of them, making a profit of 15% on each egg.
After Easter he had 360 eggs left, and he sold them at a reduced price.
What was the lowest price for each remaining egg to make sure he did not make a loss?

Show each step of your working clearly.

Answer £ _____ [5]

Q15 Karen needs a taxi to make a journey of 7.6 miles. She can use TOM'S TAXI or TAXI FOR U.

TOM'S TAXI
First mile (or part) £2.50
Each extra mile (or part) £1

TAXI FOR U
First mile (or part) £2.80
Each extra mile (or part) 80p

Which taxi firm should she use and how much cheaper is it?

Show your working clearly.

Answer _____

£ _____ [3]

Q16 Peter earns £14 000 per year.

He gets an increase of 3%.

(a) How much money is this increase per year?

Answer £_____ [2]

(b) How much money is this increase per month?

Answer £_____ [1]

Q17

COACH HIRE (day trip)

50 seater coach	£200
40 seater coach	£180

(a) What is the lowest cost to hire coaches for a group of 198 passengers for the day trip?

Answer £ _____ [2]

(b) What is the lowest cost to hire coaches for a group of 378 passengers for the day trip?

Answer £ _____ [3]

Q18 Harry has saved £15 each week for seven weeks.
He wants to buy a bike costing £285
How much would he need to save each week for the next eight weeks to pay for the bike in full?

Answer £ _____ [4]

Q19 **(a)** What percentage is £35.25 of £47?

Answer _____ % [2]

(b) John bought a new phone for £44 plus 17.5% VAT.

Mark bought a similar phone in a different shop.

Mark paid £50.31 including VAT at 17.5%

Whose phone was more expensive and by how much?

Show all your working.

Answer _____ by £ _____ [3]

Q20 Julie needs to buy 20 oranges for school hockey matches.

A single orange costs 40 pence in each of two local stores.

Each store has a special offer on oranges.

Which is better value?

Show your working clearly.

Answer _____ [4]

Q21

Northern Gas

Standing charge is 9.71 pence per day

Gas costs 4.27 pence per unit

Colin's gas meter was read on 1st September. The reading was

1	4	3	7	9

The meter was read again on 1st December. The reading was

2	2	1	9	9

(a) Complete the box to show the number of units used.

[1]

(b) Calculate the total gas bill that Colin will have to pay for the 91 days from 1st September, after VAT is charged at 5% on the total.

Answer £ _____ [4]

Q22 Membership fees at a tennis club are calculated as follows:

A registration fee of £12 plus £3 per week

Full membership is for 52 weeks.

How much does full membership cost in total?

Answer £_____ [2]

Q23 Sean earns £8 per hour for eight hours work during the week and double time for four hours work at the weekend.

Jane earns £9 per hour for six hours work during the week and time and a half for six hours work at the weekend.

Who earns more and how much more?

Answer _____ earns £ _____ more [5]

Q24

Brian hired some equipment.

There was a fixed charge of £45 plus a hire fee of £13.50 per day.

He paid £274.50 in total.

How many days did he hire the equipment for?

Answer _____ [3]

Q25

The price of a photocopier is reduced in a sale.

How much does it cost now?

Answer £ _____ [3]

Q26 Dean bought a new car.

He had to pay £220 plus 20% VAT per month for 3 years.

The mileage allowed before any charge was 30 000 miles for the 3 years.

Each additional mile was charged at 8p per mile.

After 3 years Dean had driven 37 200 miles.

How much did Dean pay in total for the 3-year period?

Answer £_____ [5]

Q27

John has a telephone with the following costs.

Line rental: £18.99 per month
Call charge: 5.8p per minute

Last month John made calls lasting 385 minutes.

Work out his telephone bill for last month.

Answer £ _____ [3]

Q28

The total population of Great Britain and Ireland is 70 million.

Information about this population is given in the table.

England	54.9 million
Northern Ireland	1.9 million
Republic of Ireland	4.6 million
Scotland	5.5 million
Wales	

(a) What is the population of Wales?

Answer _____ million [2]

(b) Sue thinks the population of Northern Ireland and Republic of Ireland makes up more than 10% of the total population of Great Britain and Ireland.

Do you agree?

Explain your answer.

Answer _____ because _____

_____ [2]

Q29

The temperature in some cities is shown in the table below.

Riga	–3°C
Helsinki	–11°C
Toronto	–6°C
Moscow	–8°C
Stockholm	–1°C

(a) List the temperatures in **ascending** order.

Answer _____ , _____ , _____ , _____ , _____ [2]

(b) How much warmer is Moscow than Helsinki?

Answer _____ °C [1]

(c) What is the difference in temperature between Helsinki and Stockholm?

Answer _____ °C [1]

Q30 The average monthly temperatures in Colorado during the ski season are shown below.

December	January	February	March	April
–14°C	–15°C	–13°C	–9°C	–5°C

(a) Which month was warmest?

Answer _____ [1]

(b) What was the difference in temperature between the warmest and coldest months?

Answer _____°C [1]

Q31 The temperatures in six cities were

Aberdeen	Belfast	Cork	Dublin	Edinburgh	Helsinki
–5°C	–1°C	2°C	1°C	0°C	–8°C

(a) What was the difference in temperature between Belfast and Helsinki?

Answer _____ °C [1]

(b) What was the difference in temperature between Cork and Helsinki?

Answer _____ °C [1]

(c) The temperature in Oslo was 2° colder than Aberdeen. What was the temperature in Oslo?

Answer _____ °C [1]

Q32 Look at the numbers below

0.31	0.301	0.303	0.103
0.1003	0.3003	0.33	0.11

(a) Which is the smallest number?

Answer _____ [1]

(b) Which of the numbers is nearest in size to $\frac{1}{9}$?

Answer _____ [1]

(c) How many of the numbers are bigger than 30%?

Answer _____ [1]

Q33

To divide any number by 28 you can first divide by 7 and then by 4

Use this idea to divide 504 by 56

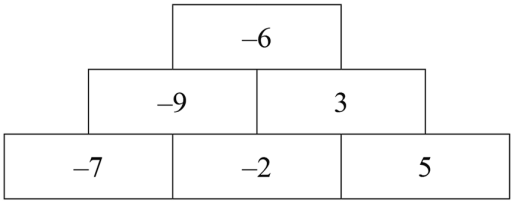
Do not use a calculator.

Show all your working.

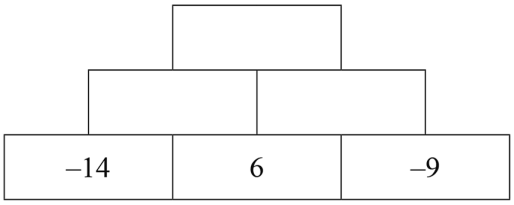
Answer _____ [2]

Q34 **(a)** Here is an example of a mathematical pyramid.

To find the number in each box you **add** the two numbers in the boxes beneath it.

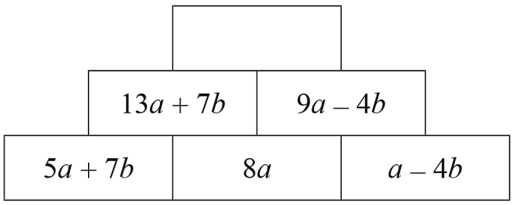


(i) Complete the following pyramid in the same way.



[2]

(ii) Here is an algebraic pyramid. Complete the top box of this pyramid.

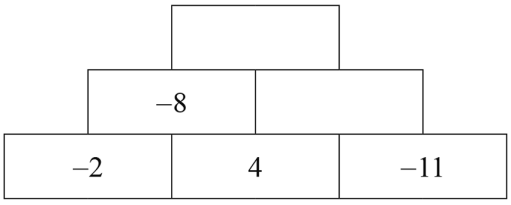


[2]

(b) Here is a different type of pyramid.

To find the number in each box you **multiply** the two numbers in the boxes beneath it.

Complete the pyramid.



[2]

Q35

At a barbeque there are 3 options.

PRICE PER OPTION

STEAK - £8.50

CHICKEN - £7.95

VEGETARIAN - £6.20

© Getty Images

30% of the people choose steak.

$\frac{1}{4}$ of the people choose chicken.

The remaining 36 people choose the vegetarian option.

Calculate the total spent on these options.

Answer £ _____ [5]

Q36

(a) Raymond's car insurance quote is £1200 for a year.

He is entitled to 30% off for his no claims discount.

If he pays online, he will get a 5% discount off this reduced price.

How much will the online price be?

Answer £ _____ [3]

(b) Raymond's father says the total discount was 35%

Is he correct?

You must show work to justify your answer.

Answer _____ [2]

Q37 Mr Jenkins is a bus driver.

His standard rate of pay is £12 per hour.

At weekends he gets "time and a half".

If he works a split shift (two separate blocks of time) on any day he gets an additional £18 for that day.

Mr Jenkins' timesheet for the first week in January is shown below.

Monday	0800–1400
Tuesday	0730–0930 and 1500–2200
Wednesday	Off
Thursday	1500–2230
Friday	Off
Saturday	0800–1500
Sunday	1230–1830

Calculate Mr Jenkins' total pay for this week.

Answer £ _____ [4]

Q38

John has a telephone with the following costs.

Line rental: £18.99 per month
Call charge: 5.8p per minute

Last month John made calls lasting 385 minutes.

Work out his telephone bill for last month.

Answer £ _____ [3]

Q39

(a) Pat buys 30 boxes of crisps.

Each **box** contains 48 **packets** of crisps.

He sells 80% of the crisps at 60p a packet.

(i) How many packets does he sell at this price?

Answer _____ [2]

(ii) How much in total does he sell them for?

Answer £ _____ [1]

(b) He sells the rest at 20p a packet.
Pat paid £25 for each box of crisps.

Does Pat make a profit or loss, and how much is this profit or loss?

Answer Pat makes a _____ of £ _____ [3]

Q40

Coffee is sold in 250 gram packets and costs £4.20 a packet.

Tea is sold in 450 gram packets and costs £3.60 a packet.

Helen runs a café and buys the same number of grams of coffee and tea.

What is the least amount of money she could have spent?

Answer £ _____ [5]

Q41

Louise normally works 38 hours per week and is paid £9.80 per hour.

If she works any extra hours, she is paid at the overtime rate of £14.50 for each extra hour.

Last week her total earnings were £473.90

How many **extra** hours did she work last week?

Answer _____ [3]

Q42

Bob is going to pave a patio. He needs 480 paving slabs.

He looks in three different stores.

Garden Store	**Perfect Patio Store**	**Quinn's Paving Store**
32 slabs in a box	**80 slabs in a box**	**16 slabs in a box**
Box price = £27	**Box price = £70**	**Box price = £17**
	10% discount on 5 or more boxes	Buy 5 boxes, get one extra box free

Which store will be the cheapest for him to buy the slabs in?

Show all your working.

Answer _____ [6]

1.

$3.2 \times 0.85 = £2.72$	MA1
$£4.07 - 2.72 = £1.35$	MA1
$1.35 \div 0.6$	MA1
$= £2.25$ per metre	A1

2.

$£3.14 \times 500 = £1570$	MA1
$500 \div 4 = 125$	
$500 - 125 = 375$	MA1
$375 \div 5 \times 4 = 300$	
$£5 \times 300 = £1500$	MA1
$£2.50 \times 75 = £187.50$	MA1
$1500 + 187.50 - 1570$	MA1
£117.50	A1

3.

$20\% = £25.80$	MA1
$129 - 25.80 = 103.20$ **or** $100 + 25.80 = 125.80$	MA1
No, as discounted price is more than £100	A1

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4. $2.55 \times 4 = £10.20$ MA1
$(14.55 - 10.20) = 4.35$ MA1
$4.35 \div 3 = £1.45$ M1, A1

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5. $10 \div 1.28 = 7.8125$ and chooses 7 MA1 A1
or alternative method $7 \times 1.28 = 8.96$ $8 \times 1.28 = 10.24$ MA1

Chooses 7 A1

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6. $375 - 95 = 280$ still to pay C1
£280 at £35 per month
So $280 \div 35 = 8$ months C1, A1

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7. Bargain £12.00 – £2.40 = £9.60 or Discount £9.00 C2
Discount £9.00 or Bargain £9.60 C1
Discount is better C1

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8. **(a)** 1520 units — MA1

(b) 1520 × 0.1455 = £221.16 — MA1
5% = £11.05(8) — MA1
Total bill = £232.21(8) — MA1

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9. £9.50 × 30 = 285 — C1
285 ÷ 5 = 57 — C1
840 ÷ 57 = 14.737 — C1, C1
15 — C1

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10. 59.77 ÷ 43 — M1
1.39 — A1

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11. **(a)** 695 — MA1

(b) 695 × 15 or 10425 — M1
104.25 — A1

(c) 5.21 — MA1

(d) 109.46 — MA1

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12. **(a)** £3.50 – £2.24 = £1.26 M1 A1

(b) Pays with 3 50s, 2 20s and 4 10s C1
Receives a 5p coin and a 1p coin C1
Smallest number of coins left is 4 C1

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13. 20% of £270 M1

£54 A1

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14. Cost price = 1200 × 2.40 = £2880 C1

Selling price = £2.76 C1

840 × 2.76 = £2318.40 C1

2880 – 2318.40 = £561.60 C1

561.60/360 = £1.56 C1

15.

£9.50 or £8.40	MA1
Taxi For U + second calculation correct	A1
£1.10	MA1

16.

(a) 14 000 × 3/100 = 420	M1 A1
(b) 35	A1

17.

(a) 4 × 200 = 800	M1 A1
(b) 6 × 200 + 2 × 180 = 1560 Allow A1 for 1580 seen	M1 A1 A1

18.

7 × 15 = 105	MA1
285 – 105 = 180	MA1
180/8 = 22.50	M1 A1

19.

(a) $\frac{35.25}{47} \times 100$ MA1

$= 75\%$ A1

(b) John's phone $\frac{17.5}{100} \times 44$ MA1

$= £7.70$

John's phone cost £51.70 MA1

John's phone is dearer by £51.70 – £50.31 = £1.39 MA1

20.

Superfruit £8.00 – £1.60 = £6.40 or Fruit Store £6.00 C2
Fruit Store £6.00 or Superfruit £6.40 C1
Fruit Store is better C1

21.

(a) 7820 A1

(b) 7820 × 4.27 = £333.914 (333.91) MA1
91 × 9.71 = £8.8361 (8.84) MA1
342.7501 × 0.05 = £17.137505 (17.14) MA1
£359.89 A1

22.

12 + 3 × 52 M1
168 A1

23.

$8 \times 8 + 8 \times 4 \times 2 = 128$	C1 C1
$9 \times 6 + 9 \times 6 \times 1.5 = 135$	C1 C1
Jane by £7	C1

24.

£274.50 – £45 = £229.50	MA1
£229.50 ÷ £13.50	MA1
17	A1

25.

15% of £489 = £73.35	MA1
£489 – £73.35	MA1
£415.65	A1

26.

$36 \times £220 = £7920$	MA1
$7920 + 1584 = 9504$	MA1
$7200 \times 8\text{p} = 57\,600\text{p} = 576$	MA1
$9504 + 576$	MA1
$= £10\,080$	A1
alternative solution	
20% of 220 = 44 220 + 44 = 264	MA1
$264 \times 3 \times 12 = 9504$	MA1
$7200 \times 8\text{p} = 57\,600\text{p} = £576$	MA1
$9504 + 576$	MA1
£10080	A1

27.

385×5.8	M1
2233p **or** £22.33	A1
22.33 + 18.99 = 41.32	A1

28.

(a) (54.9 + 1.9 + 4.6 + 5.5 =) 66.9 MA1

(70 – 66.9 =) 3.1 MA1

Alternative

70 – (54.9 + 1.9 + 4.6 + 5.5) = 3.1 MA1, MA1

(b) 10% of 70 = 7 A1

No and (1.9 + 4.6 =) 6.5 < 7 A1

Alternative

$\frac{6.5}{70} \times 100 = 9.29\%$ A1

No 9.29 < 10 A1

29.

(a) –11, –8, –6, –3, –1 MA2

allow [1] for descending order

(b) 3 (°C) A1

(c) 10 (°C) accept –10 (°C) A1

30.

(a) April A1

(b) 10 A1

31.

(a) (±)7 A1

(b) (±)10 A1

(c) –7 A1

32.

(a) 0.1003 A1

(b) 0.11 A1

(c) 5 A1

33.

504 ÷ 8 = 63 C1

63 ÷ 7 = 9 C1

34.

(a) **(i)** –8, –3 A1
–11 A1

(ii) $22a + 3b$ A1 A1

(b) –44 A1
352 A1

35.

45% = 36 MA1
1% = 0.8 MA1
(100% = 80)

Steak = 30% = 24 **or** 0.8 × 30 = 24
Chicken = $\frac{1}{4}$ = 20 **or** 0.8 × 25 = 20 MA1

24 × £8.50 + 20 × £7.95 + 36 × £6.20 = £586.20 M1 A1

36.

(a) 30% of £1200 = £360 MA1
£1200 – £360 = £840 (alternative 0.7 × 1200 = 840) MA1
5% of £840 = £42
£840 – £42 = £798 MA1

(b) 35% of 1200 = £420 MA1
1200 – 420 = 780
No MA1

alternative solution

Saving £1200 – £798 = £402 MA1
35% of 1200 = £420
No (he is incorrect) MA1

alternative solution

Saving £1200 – £798 = £402 MA1
$\frac{402}{1200} \times 100 = 33.5\%$
No (he is incorrect) MA1

37.

Weekdays = $22\frac{1}{2} \times 12 = £270$	MA1
Weekend = $13 \times 12 \times 1\frac{1}{2} = £234$	MA1
Split Shift = £18	MA1
Total = £522	MA1

alternative solution

Monday $6 \times 12 = £72$ Thursday $7.5 \times 12 = £90$	MA1
Tuesday $9 \times 12 = £108 + £18 = £126$	MA1
Saturday $7 \times 12 \times 1\frac{1}{2} = £126$ Sunday $6 \times 12 \times 1\frac{1}{2} = £108$	MA1
Total = £522	MA1

38.

385×5.8	M1
2233(p) **or** (£)22.33	A1
22.33 + 18.99 = 41.32	A1

39.

(a) **(i)** (30 × 48 =) 1440 MA1

(0.8 × 1440 =) 1152 MA1

(ii) (1152 × 60p =) 691.20 MA1

(b) (1440 – 1152 = 288; 288 × 20p =) 57.60 MA1

(30 × 25 =) 750 MA1

(691.20 + 57.60 = 748.80) loss of 1.20 A1

40.

Recognition for LCM of 250 and 450 M1

Alternative 250 = 2 × 5 × 5 × 5
450 = 2 × 3 × 3 × 5 × 5
LCM = 2 × 3 × 3 × 5 × 5 × 5 MA1

LCM = 2250 A1

9 packets of coffee and 5 packets of tea MA1

9 × 4.20 + 5 × 3.60 M1

= 55.80 A1

41.

38 × 9.80 = 372.40 MA1

473.90 – 372.40 = 101.50 MA1

101.50 ÷ 14.50 = 7 A1

follow through for numerical errors

42.

Garden Store: $480 \div 32 = 15$
$15 \times 27 = 405$ MA1

Perfect Patio: $480 \div 80 = 6$
$6 \times 70 = 420$ MA1
10% discount so final price 378 MA1

Quinn's Paving: $480 \div 16 = 30$
Needs to buy 25 boxes to get 30 MA1
$25 \times 17 = 425$ MA1

Perfect Patio is the cheapest A1
follow through for numerical errors, but not for use of incorrect methods in any of the three calculations