St. Patrick's High School, Keady

Mathematics Department

GCSE Mathematics Practice Booklet

M2

Topic 1 – Number 1

Multiples and Factors

Indices, Powers and Roots

Accuracy and Bounds

Growth and Decay

Questions taken from CCEA Past Papers

Mark Scheme included at the end of this booklet

Keady Maths

Q1 From the list

6 15 16 25 27 29 36

(a) Which is a cube number? Answer _____ [1]

(b) Which is a multiple of 12? Answer _____ [1]

(c) Which is a power of 2? Answer _____ [1]

(d) Which two numbers have a product of 375? Answer _____ and _____ [1]

Q2

2	8	9	15	17	24	27	30	36	51

Which of the above numbers are

(a) cube numbers, Answer _____ [2]

(b) prime numbers? Answer _____ [2]

Q3 **(a)** Write 2 **prime** numbers between 60 and 70

Answer _____ and _____ [2]

(b) Which of these is both a **square** number and a **cube** number?

8 16 36 64 100

Answer _____ [1]

(c) Write $\frac{3}{8}$ as a decimal.

Answer _____ [1]

(d) What percentage is £9 of £16?

Answer _____ % [2]

Q4

(a) Find the highest common factor (HCF) of 24 and 40

Answer _____ [2]

(b) Write down two numbers, greater than 1, which have a lowest common multiple (LCM) of 48

Answer _____ , _____ [2]

Q5

(a) Calculate the value of $\frac{2}{0.4^2}$

Answer _____ [2]

(b) Calculate the cube of 6

Answer _____ [1]

(c)

36	1	19	49	10	39	15	31

From the numbers in the list, write down all the

(i) prime numbers,

Answer _____ [1]

(ii) square numbers.

Answer _____ [1]

Q6 A number, expressed as a product of its prime factors, is $2^2 \times 3 \times 5^2$

(a) What is the number?

Answer _____ [1]

(b) **(i)** This number is multiplied by 9

Write the new number as a product of its prime factors.

Answer _____ [1]

(ii) Is this new number a square number?

You must explain your answer.

Answer _____ because _____

_____ [1]

Q7 Write 200 as a product of prime factors, using index notation.

Answer _____ [3]

Q8 **(a)** **(i)** Write 30 as a product of prime factors.

Answer 30 = _____ [1]

(ii) Write 22 as a product of prime factors.

Answer 22 = _____ [1]

(b) An airport bus leaves the city hall every 30 minutes.
A shuttle bus leaves the city hall every 22 minutes.
An airport bus and a shuttle bus both leave the city hall at 8.00 am.
At what time will an airport bus and a shuttle bus next leave the city hall at the same time?

Answer _____ [3]

Q9 Find the lowest common multiple (LCM) of 54 and 90

Answer _____ [2]

Q10 Write 600 as a product of prime factors.

Express your answer in index notation.

Answer _____ [3]

Q11 **(a)** Write 200 as a product of its prime factors.

Give your answer in index notation.

Answer _____ [3]

(b) Hence find the smallest number you can multiply 200 by to make a cube number.

Answer _____ [1]

Q12

(a) Priya earns £11.158 per hour.

Write this amount in pounds (£) correct to the nearest penny.

Answer £ _____ [1]

(b) Diesel costs 131.9p per litre.

Write this amount in pounds (£) correct to the nearest penny.

Answer £ _____ [1]

(c) Priya drove 11 760 miles last year.

$\frac{5}{7}$ of the miles driven were for work.

How many miles were for work?

Answer _____ miles [2]

(d) Priya's firm pays 70% of her car service.

Last year it cost £260 for her car service.

How much did Priya's firm pay?

Answer £ _____ [2]

Q13

Calculate $5.9^2 + \sqrt{80}$

Give your answer correct to 1 decimal place.

Answer _____ [2]

Q14

Conal's calculator shows the number

1378.7653

Round this number to

(a) the nearest hundred,

Answer _____ [1]

(b) one decimal place.

Answer _____ [1]

Q15 Write each of the following correct to three decimal places.

(a) 63.4034

Answer _____ [1]

(b) 0.09876

Answer _____ [1]

Q16 Write $\frac{3}{8}$, 0.4 and 35% in ascending order of size.
Show your working.

Answer _____ , _____ , _____ [3]

Q17 Ben's annual salary is £22 000. He spends 15% of this on rent.

How much is his rent **per month**?

Answer £ _____ [3]

Q18 Amy, Bronagh and Ciara did a Maths test in school.
The total for the test was 80 marks.

Amy got 50 marks out of 80
Bronagh got 65%
Ciara got $\frac{3}{5}$ of the 80 marks.

Who got the highest mark?
You must show all your working.

Answer _____ [4]

Q19 The volume of oil in a tank **decreases** by 5% every hour.
At 11am there are 9000 litres of oil in the tank.
What will the volume of oil be at 2pm?

Answer _____ litres [3]

Q20 In a group of golfers there are 37 males and 23 females.
19 of the males are wearing glasses and 14 of the females are wearing glasses.
What percentage of the group are wearing glasses?

Answer _____ % [3]

Q21 A television costs £270 plus VAT.

VAT is charged at 20%.

Calculate the VAT charged.

Answer £ _____ [2]

Q22 A box contains 560 g of cornflakes.

A box on special offer contains an extra 35% of cornflakes.

How many grams of cornflakes are in the special offer box?

Answer _____ g [3]

Q23 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]

Q24 **(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]

Q25 Pupils were asked which activity they prefer.

The results were

Cinema	35% of the pupils
Bowling	$\frac{2}{5}$ of the pupils
Ice skating	$\frac{1}{4}$ of the pupils

(a) The teacher says "Bowling was more popular than cinema."

Is the teacher correct?

You must show working to explain your answer.

Answer _____ because _____

_____ [2]

(b) 15 pupils said they preferred ice skating.

How many pupils were asked altogether?

Answer _____ [2]

Q26 A tracksuit normally cost £75

(a) In a sale the price was reduced by 15%

Calculate the sale price of the tracksuit.

Answer £ _____ [3]

(b) The following week the shop displayed this sign.

FINAL STOCK CLEARANCE
A FURTHER 20% OFF ALL SALE PRICES

Show that the tracksuit now costs £51

[2]

(c) Rhys says, "I am getting 15% off, then 20% off, so I am getting 35% off the £75."

Is he correct?

You must show working to explain your answer.

Answer _____ because _____

_____ [2]

1.

(a) 27 A1

(b) 36 A1

(c) 16 A1

(d) 15 and 25 A1

2.

(a) 8, 27 A1 A1

(b) 2, 17 A1 A1

3.

(a) 61, 67 A1, A1

(b) 64 A1

(c) 0.375 A1

(d) $\frac{9}{16} \times 100 = 56.25$ M1 A1

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4. **(a)** 1 2 3 4 6 8 12 24

1 2 4 5 8 10 20 40 MA1

HCF = 8 A1

(b) 3 and 16, or any factor of 48 $\neq$ 1 and 48 A2
(allow A1 for combinations of 2, 24 or 4, 12 or 6, 8)

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5. **(a)** Sight of 0.16 MA1

12.5 A1

(b) 216 A1

(c) **(i)** 19, 31 and no others A1

(ii) 36, 1, 49 and no others A1

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6. **(a)** 300 A1

(b) **(i)** $2^2 \times 3^3 \times 5^2$ A1

(ii) No because not all the prime factors are squared A1
or alternative
No because 2700 is not a square number

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7. $200 = 2 \times 2 \times 2 \times 5 \times 5$ M1 A1

$2^3 \times 5^2$ A1

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8. **(a) (i)** $30 = 5 \times 3 \times 2$ A1

(ii) $22 = 11 \times 2$ A1

(b) using LCM of 30 and 22 M1
$11 \times 5 \times 3 \times 2 = 330$ minutes $= 5.5$ hours A1
1.30pm A1

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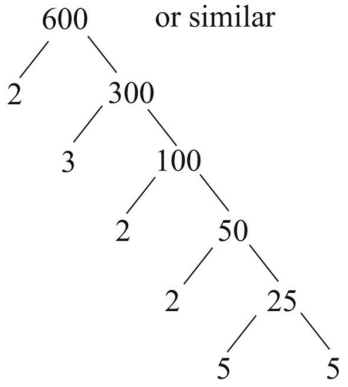
9. $54 = 2 \times 3 \times 3 \times 3$ and $90 = 2 \times 3 \times 3 \times 5$ MA1
270 A1

10.

2	600
2	300
2	150
3	75
5	25
	5

or

5	600
5	120
3	24
2	8
2	4
	2



or similar

M1 A1

$2^3 \times 3 \times 5^2$ MA1

11.

(a) Correct method used M1

$2 \times 2 \times 2 \times 5 \times 5$ A1

$2^3 \times 5^2$ A1

(b) 5 (gives 1000) A1

12.

(a) 11.16 A1

(b) 1.32 A1

(c) $\frac{5}{7}$ of 11760 = 8400 M1 A1

(d) $\frac{70}{100} \times 260 = 182$ M1 A1

13.

43.75427191	MA1
43.8	A1

14.

(a) 1400	A1
(b) 1378.8	A1

15.

(a) 63.403	A1
(b) 0.099	A1

16.

$\frac{3}{8} = 0.375$	MA1
$35\% = 0.35$	MA1
$35\%, \frac{3}{8}, 0.4$	A1

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17. $\frac{15}{100} \times 22\,000 = 3300$ M1, A1

275 MA1

18.

			Alternative		
Bronagh	$\frac{65}{100} \times 80$	C1	Amy	$\frac{50}{80} \times 100\%$	C1
Ciara	$80 \div 5 \times 3$	C1	Ciara	$\frac{3}{5} \times 100\%$	C1
52 and 48 marks both correct		C1	62.5% and 60% both correct		C1
Bronagh		C1	Bronagh		C1

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19. 8550 MA1

8122.5 MA1

7716.375 (accept 7716) or (7716.38) or (7716.4) MA1

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20. $\frac{33}{60}$ MA1

$\frac{33}{60} \times 100 = 55\%$ M1 A1

21.

20% of £270	M1
£54	A1

22.

$560 \times \frac{35}{100}$	M1
196	A1
756	MA1

23.

(a) $14\,000 \times 3/100 = 420$	M1 A1
(b) 35	A1

24.

(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

25.

(a) evidence of 40% or 0.4 MA1
Yes because 40% is greater than 35% A1

(b) 15×4 MA1
60 A1

26.

(a) 15% of 75 = 11.25 MA1
75 – 11.25 MA1
63.75 A1

(b) 20% of 63.75 = 12.75 MA1
63.75 – 12.75 = 51 A1

(c) 35% of 75 = 26.25 or 75 – 26.25 = 48.75 MA1
No, not equal to 51 A1
