GCSE · Edexcel · Maths

2 hours 40 questions

Exam Questions

Number Operations

Mathematical Symbols / Order of Operations (BIDMAS/BODMAS) / Irrational Numbers / Negative Numbers / Money Calculations / Addition & Subtraction / Multiplication & Division / Related Calculations / Systematic Lists / Product Rule for Counting

Easy (12 questions)	/26
Medium (16 questions)	/53
Hard (12 questions)	/46
Total Marks	**/125**

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Easy Questions

1 (a) Given that $1793 \times 185 = 331\,705$

Write down the value of

1.793×185

(1 mark)

(b) $331\,705 \div 1.85$

(1 mark)

2 Use the fact that

$5.4 \times 36 = 194.4$

to find the value of

i) 5.4×3.6

[1]

ii) 54×360

[1]

(2 marks)

3 Using the information that

$6.7 \times 52 = 348.4$

find the value of

i) 6.7×520

[1]

ii) 67×0.52

[1]

iii) $3484 \div 5.2$

[1]

(3 marks)

4 Work out 1.83×47

(3 marks)

5 Work out 54.6×4.3

(3 marks)

6 Work out 6.34×5.2

(3 marks)

7 There are 14 boys and 12 girls in a class.

Work out the total number of ways that 1 boy and 1 girl can be chosen from the class.

(2 marks)

8 Choose the reciprocal of $\frac{5}{6}$

A. $\frac{6}{5}$

B. $\frac{1}{6}$

C. $-\frac{1}{6}$

D. $-\frac{6}{5}$

(1 mark)

9 Choose the list of **all** the integers that satisfy $-2 < x \leqslant 4$

A. –2, –1, 0, 1, 2, 3

B. –1, 0, 1, 2, 3

C. –2, –1, 0, 1, 2, 3, 4

D. –1, 0, 1, 2, 3, 4

(1 mark)

10 Give one reason why 0 is an even number.

(1 mark)

11 Marta says

"odd square numbers have exactly three factors."

Give one example where this is correct and another where this is not correct.

In each case, write down the number and its factors.

(2 marks)

12 Shukra goes into a flower shop and buys two orchids and a chrysanthemum.

Each orchid costs £12.80.

The chrysanthemum costs £15.75.

Shukra pays with a £50 note.

She thinks she will get more than £8 in change.

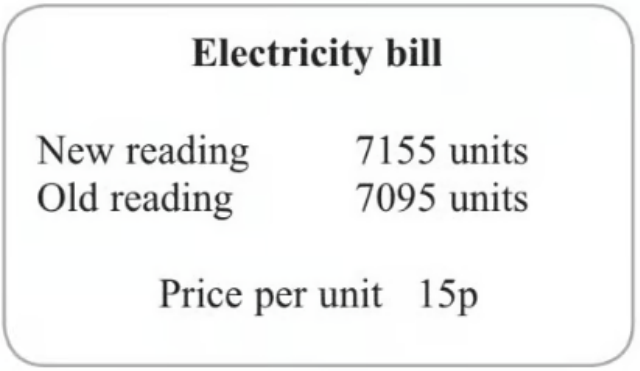
Is Shukra correct?

You must show how you get your answer.

(3 marks)

Medium Questions

1 Here is part of Gary's electricity bill.



Electricity bill

New reading	7155 units
Old reading	7095 units
Price per unit	15p

Work out how much Gary has to pay for the units of electricity he used.

(4 marks)

2 (a) Tracey is going to choose a main course and a dessert in a cafe. She can choose from 8 main courses and 7 desserts.

Tracey says that to work out the number of different ways of choosing a main course and a dessert you add 8 and 7.

Is Tracey correct?

You must give a reason for your answer.

(1 mark)

(b) 12 teams play in a competition.

Each team plays each other team exactly once.

Work out the total number of games played.

(2 marks)

3 (a) There are 17 men and 26 women in a choir.

The choir is going to sing at a concert.

One of the men and one of the women are going to be chosen to make a pair to sing the first song.

Work out the number of different pairs that can be chosen.

(2 marks)

(b) Two of the men are to be chosen to make a pair to sing the second song.

Ben thinks the number of different pairs that can be chosen is 136 Mark thinks the number of different pairs that can be chosen is 272

Who is correct, Ben or Mark?

Give a reason for your answer.

(1 mark)

4 There are 16 hockey teams in a league.

Each team played two matches against each of the other teams.

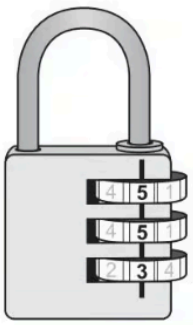
Work out the total number of matches played.

(2 marks)

5 (a) There are three dials on a combination lock.

Each dial can be set to one of the numbers 1, 2, 3, 4, 5

The three digit number 553 is one way the dials can be set, as shown in the diagram.



Work out the number of different three digit numbers that can be set for the combination lock.

(2 marks)

(b) How many of the possible three digit numbers have three different digits?

(2 marks)

6 (a) Tom is tiling a wall.

He needs to buy at least 100 tiles.

The tiles are sold in large packs and small packs.

Large pack 40 tiles	£18
Small pack 28 tiles	£14

Special offer

25% reduction when you buy 3 or more **large** packs

Work out the cheapest cost for Tom to buy the packs of tiles he needs.

£.....

(3 marks)

(b) Tom is also tiling a floor.

The floor is a rectangle with length 600 cm and width 240 cm Each tile is a square with side 40 cm

Tom uses this method to work out the number of tiles he needs.

Number of tiles that will fit along the length	= 600 ÷ 40 = 15
Number of tiles that will fit along the width	= 240 ÷ 40 = 6
Total number of tiles needed	= 15 + 6 = 21

Give a reason why Tom's method is wrong.

(1 mark)

7 (a) A building company employs

- 2 labourers
- 14 joiners
- 9 electricians
- 8 plumbers.

For a job, the company needs one of each type of worker.

In how many ways can the company choose the four workers?

(2 marks)

(b) One labourer and two plumbers are on holiday.

In how many ways can the company now choose the four workers?

(2 marks)

8

Lunch

Choose one starter and one main course

There are four starters and ten main courses to choose from.

Two of the starters and three of the main courses are suitable for vegans.

What percentage of the possible lunches have **both** courses suitable for vegans?

(3 marks)

9

Meal Deal

Choose one sandwich, one drink and one snack

There are
7 different sandwiches
5 different drinks
and
3 different snacks.

How many different Meal Deal combinations are there?

(2 marks)

10 A code has 4 digits.

Each digit is a number from 0 to 9.

Digits may be repeated.

The 4-digit code is an even number.

The first digit is 3. How many possible codes are there?

(2 marks)

11 Ann picks a 4-digit number.

The first digit is **not** zero.
The 4-digit number is a multiple of 5.

How many different 4-digit numbers could she pick?

(3 marks)

12 The table shows the children nominated to win the subject prize in Mathematics and the subject prize in English.

Mathematics	English
Alice	Alice
Ben	Claire
Emma	Gabi
Paddy	Simon

The winner of each subject prize is picked at random.
It is possible for Alice to win both prizes.

In what percentage of the combinations of prize winners does Alice win **at least** one prize?

(4 marks)

13 (a) A menu has

- 6 starters
- 10 main dishes
- 7 desserts.

A three-course meal consists of a starter, a main dish and a dessert.

How many different three-course meals are possible?

(2 marks)

(b) A two-course meal consists either of a starter with a main dish, a starter with a dessert or a main dish with a dessert.

Show that there are 172 possible different two-course meals.

(3 marks)

14 Andrew is thinking of a number.

- It is between 1 and 150.
- It is one more than a square number.
- It is three less than a cube number.
- It is not a prime number.

What is Andrew's number?

You must show all your reasoning.

(4 marks)

15 A restaurant menu has 8 starters, 12 mains and 6 desserts.

A customer can choose from the following meals

- a starter and a main,
- a main and a dessert,
- a starter, a main and a dessert.

Show that there are 744 different ways of choosing a meal at this restaurant.

(3 marks)

16 Work out 8.3×5.7

(3 marks)

Hard Questions

1 (a) The diagram shows a patio in the shape of a rectangle.

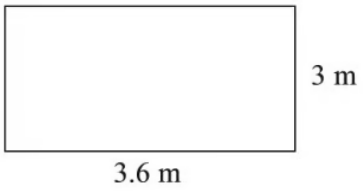


Diagram **NOT** accurately drawn

The patio is 3.6m long and 3 m wide.

Matthew is going to cover the patio with paving slabs.

Each paving slab is a square of side 60 cm.

Matthew buys 32 of the paving slabs.

Does Matthew buy enough paving slabs to cover the patio?

You must show all your working.

(3 marks)

(b) The paving slabs cost £8.63 each.

Work out the total cost of the 32 paving slabs.

(3 marks)

2 Steve wants to put a hedge along one side of his garden.

He needs to buy 27 plants for the hedge. Each plant costs £5.54.

Steve has £150 to spend on plants for the hedge.

Does Steve have enough money to buy all the plants he needs?

(4 marks)

3

Train tickets

day return £6.45

monthly saver £98.50

Sue goes to work by train.

Sue worked for 18 days last month.
She bought a day return ticket each day she worked.

A monthly saver ticket is cheaper than 18 day return tickets.
How much cheaper?

(4 marks)

4 Jeff is choosing a shrub and a rose tree for his garden.
At the garden centre there are 17 different types of shrubs and some rose trees.

Jeff says,

"There are 215 different ways to choose one shrub and one rose tree."

Could Jeff be correct?
You must show how you get your answer.

(2 marks)

5 (a) Marie has 25 cards.
Each card has a different symbol on it.

Marie gives one card to Shelley and one card to Pauline.

In how many different ways can Marie do this?

(2 marks)

(b) There are 12 boys and 10 girls in David's class.
David is going to pick three different students from his class and write their names in a list in order.

The order will be

boy girl boy	**or**	girl boy girl

How many different lists can David write?

(3 marks)

6 Tom is going to buy 25 plants to make a hedge.

Here is information about the cost of buying the plants.

Kirsty's Plants
£2.39 each

Hedge World
Pack of 25
£52.50 plus VAT at 20%

Tom wants to buy the 25 plants as cheaply as possible.

Should Tom buy the plants from Kirsty's Plants or from Hedge World?
You must show all your working.

(5 marks)

7 (a) Ali and Mel are making 3-digit codes.
The digit 0 is **not** used.

Ali only uses odd digits.
Mel only uses even digits.

Ali can make x more codes than Mel.
Assume that digits **cannot** be repeated.

Work out the value of x.

(3 marks)

(b) In fact, digits **can** be repeated.

What does this tell you about the actual value of x?

Tick **one** box.

☐	It is bigger than my answer to part (a)
☐	It is smaller than my answer to part (a)
☐	It is the same as my answer to part (a)

(1 mark)

8 a is a prime number.

b is an even number.

$N = a^2 + ab$

Choose the correct statement about N.

A. could be even or odd

B. always even

C. always prime

D. always odd

(1 mark)

9 Here are two methods to make a 4-digit code.

Codes can have repeated digits.

Method A

For the first two digits use an odd number between 30 and 100

For the last two digits use a multiple of 11

Method B

Use four digits in the order even odd even odd

Do **not** use the digit zero

Which method gives the **greater** number of possible codes?
You **must** show your working.

(3 marks)

10 (a) Diners choose one starter and one main from the options given in the table below.
Vegetarian dishes are indicated with a (v).

Starter	Main
Cheese salad (v)	Steak and chips
Prawn cocktail	Fish and chips
Mozzarella sticks (v)	Tomato pizza (v)
	Pork chops
	Nut cutlet (v)

Work out the fraction of all the meal combinations which have at least one vegetarian option.

(3 marks)

(b) Diners also choose one of 6 dessert options.

How many different three-course meal combinations are available?

(2 marks)

11 Alfie paints his model lorry.
He has eight colours available.

He decides to paint the cab in one colour and the trailer in a different colour.

He then wants to paint his name on the trailer.
The name must be in a different colour to the trailer.

In how many different ways can Alfie paint his model lorry?

(3 marks)

12 (a) John has

- 8 different shirts
- 6 different hats
- 4 different scarves.

On Monday, he picks a shirt, a hat and a scarf.

Show that there are 192 different combinations he can pick.

(1 mark)

(b) John thinks that if he picks just two of the three items of clothing there will be more than 192 combinations.

Is he correct?

Show your reasoning.

(3 marks)