Product Rule For Counting

Revise this topic →

← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the AQA Level 2 Certificate in Further Maths.
It may not be suitable for other courses.

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Answer **all** questions in the spaces provided.

1   A school awards a prize to one student for each of the subjects maths, English and science.

Teachers nominate students and the headteachers picks one winner per subject.

This year there were

5 nominations for maths
4 nominations for English
2 nominations for science

1 (a)   How many different ways can the headteacher select the award winners?

[2 marks]

Answer _____

One student was nominated for both the maths and science prize.

All other students are only nominated for one award.

The headteacher doesn't want any students to receive more than one award.

1 (b)   How many different ways can the headteacher select the award winners with no student winning more than one award.

[2 marks]

Answer _____

2   Abbie is selecting a new mobile phone.

When choosing the phone configuration there are

         4 possible memory sizes
         2 possible processor speeds
         12 possible colours

2 (a)   How many different possible phone configurations are there?

[2 marks]

Answer _____

Abbie's mum Jenny also wants a phone.

Jenny wants her phone to

         have either a 32 GB, 64 GB or 128 GB of memory
         have the fastest processor possible
         be a colour that she likes

2 (b)   Jenny calculates that this is 25% of the total possible configurations.
How many of the colours does Jenny like?

[2 marks]

Answer _____

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Turn over ▶

Video Solutions

3   Isaac, Jamie, Kezia, Lucy and Miriam are contestants on a gameshow.

The gameshow has four rounds that are music, science, sport and history.

The team must select one player for each round.

A player can be selected for multiple different rounds.

3 (a)   How many ways are there of selecting players for the four rounds?   **[2 marks]**

Answer _____

3 (b)   If instead each player can only play one round, how many ways are there of selecting players for the four rounds now?   **[2 marks]**

Answer _____

Do not write outside the box

4   Here are the birthdates of 5 members of a chess club.

Rees	Jamie	Jack	Luke	Joel
10th	21st	24th	14th	15th

They need to select a 6 digit code number for the lock on their chess equipment.

They do this by selecting three of their birthdates and writing them as a number.

For example if was Rees chosen first, Jamie second and Jack third the code would be 102124

4 (a)   How many possible 6 digit code numbers can be made in this way?   **[2 marks]**

Answer _____

4 (b)   How many of 6 digit code numbers that can be made are a multiple of 5?

[2 marks]

Answer _____

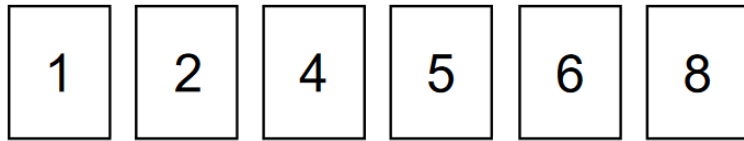**4 (c)**   How many of 6 digit code numbers that can be made are greater than 150 000?

[2 marks]

Answer _____

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Turn over ▶

5   Here are six numbered cards.

| 1 | 2 | 4 | 5 | 6 | 8 |

5 (a)   Using all of cards how many different 6 digit numbers can be made?   **[2 marks]**

Answer _____

5 (b)   Using the cards how many different 5 digit numbers can be made?   **[2 marks]**

Answer _____

5 (c)   Using the cards how many different 4 digit numbers can be made that are a multiple of 5?   **[2 marks]**

Answer _____

5 (d)   Using the cards how many different numbers can be made that are between 40 000 and 500 000   **[3 marks]**

Answer _____

6   How many integers between 40 000 and 90 000 can be formed from these digits

   3   4   6   8   9

with no repetition of any digit?

[2 marks]

Answer _____

7   How many even integers greater than 500 000 can be formed from these digits

   1   2   3   5   7   9

with no repetition of any digit?

[3 marks]

Answer _____

8   How many four-digit multiples of 5 are there if the first digit is greater than 3?

   1   2   3   5   7   9

with no repetition of any digit?

[3 marks]

Answer _____

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Turn over ▶

Video Solutions

9 How many 5 digit even numbers can be made from these digits

1   3   6   7   8

with no repetition of any digit?

[2 marks]

_____

_____

_____

_____

Answer _____

10 Here are six numbered cards.

| 3 | 4 | 5 | 6 | 7 | 8 |
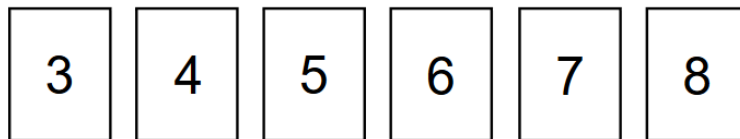
Using five or six of the cards, how many numbers can be made greater than 60 000

[3 marks]

_____

_____

_____

_____

_____

Answer _____

Do not write outside the box

11   Integers are made using some of the digits 1, 2, 3, 4, 5 and 6.

Each integer made

is greater than 3000
has no digit repeated
is a multiple of 5

How many integers can be made?

[4 marks]

Answer _____

12   Integers are made using some of the digits 2, 4, 6, 7, 8, and 9

Each integer made

is greater than 80000
has no digit repeated
is odd

How many integers can be made?

[4 marks]

Answer _____

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Video Solutions