

Product Rule for Counting

For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name _____

Total marks: **23**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** A shop sells phone cases.
Each phone case is one of 9 colours and has one of 6 patterns.
How many different phone cases are possible?

.....
(1)

(Total for Question 1 is 1 mark)

- 2** A car number plate has 2 letters followed by 3 digits.
The letters can be any of the 26 letters and the digits can be any from 0 to 9
How many different number plates are possible?

.....
(2)

(Total for Question 2 is 2 marks)

- 3** Amir has 5 books. He puts 3 of them in a row on a shelf.
How many different ways can he do this?

.....
(2)

(Total for Question 3 is 2 marks)

- 4 (a) How many two-digit numbers can be made from the digits 1, 3, 5 and 7 if no digit is repeated?

.....
(2)

- (b) How many of these numbers are greater than 50?

.....
(1)

(Total for Question 4 is 3 marks)

- 5 A computer game gives each player a username of 3 letters.
The letters are chosen from

A B C D E F G H

For example, CAB is one username.

- (a) Letters may be used more than once.
Work out the number of different usernames that can be made.

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(2)

- (b) Now each letter can be used only once.
The first letter of the username must be a vowel.
How many different usernames are possible?

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(2)

(Total for Question 5 is 4 marks)

- 6 Some people take part in a table-tennis tournament.
Each player plays every other player exactly once.
A total of 36 games are played.
Work out the number of players in the tournament.

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(2)

(Total for Question 6 is 2 marks)

- 7 A drama group has 11 actors.
The director chooses one actor to play the hero and a different actor to play the villain.
Ifeoma says,
 "There are 121 different ways to choose the hero and the villain."

Is Ifeoma correct?
You must give a reason for your answer.

.....
(2)

(Total for Question 7 is 2 marks)

- 8 An ice-cream van sells ice cream in a cone or in a tub.
There are 6 flavours and 4 sauces.
A customer chooses one flavour and either a cone or a tub.
They then choose one sauce or they choose no sauce.

Show that there are 60 different ways to choose an ice cream.

(2)

(Total for Question 8 is 2 marks)

- 9 A password is made of 3 letters from A to Z followed by 2 digits from 0 to 9
Letters cannot be repeated. Digits can be repeated.
Show that there are more than 1.5 million possible passwords.

(2)

(Total for Question 9 is 2 marks)

- 10 A cycling club has 18 senior members and 7 junior members.
One senior member is chosen to be captain.
A different senior member is chosen to be vice-captain.
One junior member is chosen to be junior representative.

Work out the number of different ways these three people can be chosen.

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(3)

(Total for Question 10 is 3 marks)
