

Name:

Date:

Product Rule for Counting

GCSE

Edexcel
Mathematics
Grade (9-1)

Mark

Score (%)

— 52

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Materials

For this paper you must have:

- Ruler
- Pencil, Rubber, Protractor and Compass
- Scientific calculator, which you are expected to use when appropriate

Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown
- Do all rough work in this book. Cross out any rough work you don't want to be marked

Information

- The marks for the questions are shown in brackets

<p>1 Calculate the following:</p> <p>(a) $3!$</p> <p>..... (1)</p> <p>(a) $5!$</p> <p>..... (1)</p> <p>(Total for question 1 is 2 marks)</p>	<p>Leave blank</p> <p><input type="text"/></p>
<p>2 Adam has three toys which are coloured yellow, blue and green. How many different ways can he arrange his toys.</p> <p>.....</p> <p>(Total for question 2 is 2 marks)</p>	<p><input type="text"/></p>
<p>3 Five students are doing a 100m race. How many different ways can their finishing positions be arranged?</p> <p>.....</p> <p>(Total for question 3 is 2 marks)</p>	<p><input type="text"/></p>
<p>4 Emma has 2 different coloured jumpers and 2 different colours of jeans. How many different combinations of clothing can she wear?</p> <p>.....</p> <p>(Total for question 4 is 2 marks)</p>	<p><input type="text"/></p>

5 Ahmed is looking at a menu of a restaurant.
 He sees 5 options for starters and 3 options for the main course.
 How many different ways can he pick one option from each?

.....
(Total for question 5 is 2 marks)

6 The school head is to pick one girl and one boy from a class of 8 girls and 9 boys.
 How many different ways can she pick them?

.....
(Total for question 6 is 2 marks)

7 Tim has a collection of 3 ties of colours red, blue and green.
 He also has 4 shirts coloured; white, pink, red and purple.
 He decides to randomly pick a tie and then a shirt.
 What is the probability that he pick a red tie and a white shirt?

.....
(Total for question 7 is 3 marks)

8 James is selecting a pizza.
He needs to pick a topping from 3 choices, crust type from 2 options, and size from 5 options.
How many different combinations can he choose?

Leave
blank

.....
(Total for question 8 is 2 marks)

9 Lucy says there is 121 different ways she can pick one boy and one girl from her class for a duet.
Given that there is 11 girls, work out the number of boys there must be.

.....
(Total for question 9 is 2 marks)

10 Tarek says that there is 255 ways of picking a fruit and a drink from a shop.
Given that there are 20 drinks to choose from explain why he must be incorrect.

.....
(Total for question 10 is 2 marks)

11 How many ways can Sam pick two cards from a deck of 52 cards.

.....
(Total for question 11 is 2 marks)

12 Khadijah needs to pick two of her friends to take with her to the theme park.
She has 8 friends.
How many different pairs of friends can she take?

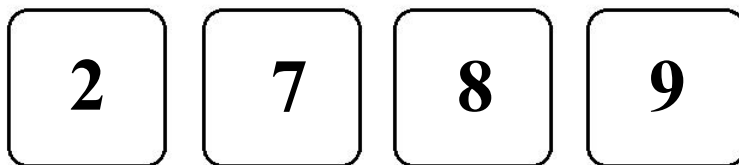
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.....
(Total for question 12 is 2 marks)

13 Alan is going on a business trip.
He decides to take 2 shirts from his collection of 10 shirts.
How many different combinations can he take with him?

.....
(Total for question 13 is 2 marks)

14 Billy makes 4 digit numbers using all of these cards.



How many different numbers greater than 6000 can Billy make?

.....
(Total for question 14 is 3 marks)

15 Mary picks a 4 digit pin for his debit card.
Each digit is a number from 0-9.
Mary can repeat digits.
His pin starts with a 56

(a) How many possible codes are there?

.....

(2)

(b) Bob creates a 4-digit code for her debit card.
Her first digit is 4, the 4-digit code is odd.
How many possible codes are there?

.....

(2)

(Total for question 10 is 4 marks)

16 There are three dials on a combination lock. Each dial can be set to 1 - 7.

(a) Work out the total number of different three digit numbers that can be used

.....

(2)

(b) Work out the total number of different three digit numbers that can be used that have three different digits.

.....

(2)

(Total for question 16 is 4 marks)

17 Olly picks a 4-digit even number.
The first digit is greater than 6.
The second digit is half the first digit.
The third digit is less than 6.
How many different numbers could he pick?

.....
(Total for question 17 is 3 marks)

18 How many odd numbers greater than 40,000 can be created used these digits: 1 2 6 7 8

.....
(Total for question 18 is 4 marks)

- 19** Ethan picks a 3 digit number.
The first digit is greater than 2, the last digit is a multiple of 4.
How many different 3-digit numbers could he pick?

.....
(Total for question 19 is 3 marks)

- 20** A restaurant has 3 starters, 5 main courses and 4 deserts.
A meal deal allow you to pick 1 starter, 2 mains and 1 desert.
How many different meals can he have?

.....
(Total for question 20 is 4 marks)