GCSE (1 - 9)

The Product Rule for Counting

Instructions

- · Use black ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
- there may be more space than you need.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must show all your working out.

Information

- The marks for each question are shown in brackets
- use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- · Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1 There are 12 boys and 15 girls in a class.
One boy and one girl will be selected to represent the class on the student council.
Work out the total number of ways of choosing a boy and a girl.

12 x 15



(Total for question 1 is 2 marks)

2 There are 17 boys and 14 girls in a choir.
One boy and one girl will be selected to sing a duet.
Work out the total number of ways of choosing a boy and a girl.

17×14



(Total for question 2 is 2 marks)

3 There are 14 boys and x girls in a choir.
One boy and one girl will be selected to sing a duet.
Taylor says there are 152 different ways of choosing a boy and a girl.

Could Taylor be correct?
You must show your working.

$$14x = 152$$

 $x = 10.857...$

Taylor cannot be correct. 152 is not divisible by 14.

(You cannot have 0.857 or a girl)

(Total for question 3 is 2 marks)

4 There are 5 starters and 6 main courses in a restaurant.

Work out the total number of ways of choosing a starter and a main course.

5 × 6

30

(Total for question 4 is 2 marks)

5 There are 4 starters, 7 main courses and 4 desserts in a restaurant.

Work out the total number of ways of choosing a starter, a main course and a dessert.

4x7x4

1/2

(Total for question 5 is 2 marks)

6 There are 5 starters, 6 main course and x desserts in a restaurant.

Riley says there are 130 different ways of a starter, a main course and a dessert.

Could Riley be correct?

You must show your working.

$$30x = 130$$

 $x = 4.3$

Riley cannot be correct. & would have to be a whole number.

(Total for question 6 is 2 marks)

7 A meal deal includes a sandwich and a drink. There are 5 sandwiches and 7 drinks to choose from.

Work out the total number of ways of choosing a sandwich and a drink.

5×7

35

(Total for question 7 is 2 marks)

8 Mr Idris has 5 pairs of trousers, 9 shirts and 3 ties.

Work out the total number of ways of choosing a pair of trousers, a shirt and a tie.

5x9x3

135

(Total for question 8 is 2 marks)

9 There are 8 sandwiches and x drinks to choose from for lunch.

Pat says there are 96 different ways to choose a sandwich and a drink.

Could Pat be correct?

You must show your working.

$$x = 12$$

Pat could be correct. 2 could be 12.

(Total for question 9 is 2 marks)

10 There are 52 cards in a deck.
Peter is going to give one card to Casper and one card to Kelly.

How many different ways are there of going this?

52 x 51

2652

(Total for question 10 is 2 marks)

11 There are 52 cards in a deck.

Angel is going to give one card to Ben and one card to Chris and one card to Dylan.

How many different ways are there of going this?

52 x 51 x 50

132600

(Total for question 11 is 2 marks)

12 There are 52 cards in a deck.
Tom is going to give two cards to Jay.

How many different pairs of cards could Jay get?

1326

(Total for question 12 is 2 marks)

13 There are 30 students in a class.

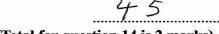
Two students are going to be selected to receive a prize.

How many different pairs of two students could be selected?

14 There are 10 teams in a football league.

Two teams are going to be chosen at random to play a match.

Work out the number of different matches that could take place.



(Total for question 14 is 2 marks)

15 There are 8 teams in a competition. Each team will play every other team once.

Work out the total number of games played.

16 There are 10 people in a room. Each person shakes each other person's hand once.

Work out the number handshakes that take place.

45

(Total for question 16 is 2 marks)

17 There are 20 people in a room. Each person shakes each other person's hand once.

Work out the number handshakes that take place.