

The Product Rule for Counting

ANSWERS 

1

A sandwich is one bread (A to C) and one filling (1 to 5). Each sandwich is one square. How many are there?

	1	2	3	4	5
A	A1	A2	A3	A4	A5
B	B1	B2	B3	B4	B5
C	C1	C2	C3	C4	C5

3 rows, 5 in each row

one box for each choice

$$3 \times 5$$

Answer 15

2

A badge is one colour (A to D) and one shape (1 to 3). Each badge is one square. How many are there?

	1	2	3
A			
B			
C			
D			

one box for each choice

$$4 \times 3$$

Answer 12

3

A code is one letter from A to E followed by one digit from 0 to 9. How many codes are there?

one box for each choice

$$5 \times 10$$

Answer 50

4

A menu has 3 starters, 5 mains and 2 desserts. How many different three-course meals are there?

one box for each choice

$$3 \times 5 \times 2$$

Answer 30

5

A lock has 3 dials. Each dial shows a digit from 0 to 9. How many settings are there?

$$10 \times 10 \times 10$$

Answer 1000

6

A 3-digit code uses the digits 1 to 5 with no digit repeated. How many codes are there?

$$5 \times 4 \times 3$$

Answer 60

7

In how many different orders can 4 people stand in a line?

$$4 \times 3 \times 2 \times 1$$

Answer 24

8

A team has 8 players. A captain and a different vice-captain are chosen. How many ways are there?

$$8 \times 7$$

Answer 56

The Product Rule for Counting *further practice*

ANSWERS 

9

In how many different orders can 6 different books be put on a shelf?

$$6 \times 5 \times 4 \times 3 \times 2 \times 1$$

Answer 720

10

A 4-digit PIN uses the digits 0 to 9. No digit is repeated and the first digit cannot be 0. How many different PINs are there?

$$9 \times 9 \times 8 \times 7$$

Answer 4536

11

A café's meal deal is one sandwich and one drink. There are 5 sandwiches to choose from and 35 different meal deals. How many drinks are there to choose from?

$$5 \times ? = 35$$

Answer 7 drinks

12

Code A is 3 letters from A to Z. Code B is 4 digits from 0 to 9. Letters and digits can repeat. Which type of code has more possible codes? Show how you know.

$$26^3 = 17\,576, 10^4 = 10\,000$$

Answer Code A

13

How many 3-digit even numbers can be made from the digits 1, 2, 3, 4, 5 and 6 if no digit is used more than once?

$$\text{last digit first: } 3 \times 5 \times 4$$

Answer 60

14

A league has 12 teams. Each team plays every other team twice, once at home and once away. How many matches are played?

$$\text{home team} \times \text{away team} = 12 \times 11$$

Answer 132 matches

15

An ice cream has two scoops of different flavours, one on top of the other. Swapping the scoops makes a different ice cream. There are 42 different ice creams. How many flavours are there?

$$7 \times 6 = 42$$

Answer 7 flavours

16

Ali says the number of ways to choose 2 people from 6 to share a task is $6 \times 5 = 30$. Is Ali right? Explain.

$$\text{each pair is counted twice}$$

Answer No, it is 15