The product rule for counting

ANSWERS

1

A wrap is one filling (A to C) and one sauce (1 to 4). Each wrap is one square.
How many wraps are there?

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

3 × 4

Answer 12

2

A cap is one colour (A to E) and one size (1 to 3). Each cap is one square.
How many caps are there?

	1	2	3
A	A1	A2	A3
B	B1	B2	B3
C	C1	C2	C3
D	D1	D2	D3
E	E1	E2	E3

5 × 3

Answer 15

3 Notice the change!

A card has one of 6 pictures and one of 4 colours. How many different cards are there?

6 × 4

Answer 24

4 Notice the change!

A meal deal is one sandwich, one snack and one drink. There are 4 sandwiches, 3 snacks and 5 drinks. How many meal deals are there?

4 × 3 × 5

Answer 60

5

A code is a letter from A to D, then two digits from 0 to 9. Digits can repeat.
How many codes are there?

4 × 10 × 10

Answer 400

6 Notice the change!

In how many different orders can 5 books stand on a shelf?

5 × 4 × 3 × 2 × 1

Answer 120

7

A chair and a secretary are picked from 12 people. They must be different people. In how many ways can they be picked?

12 × 11

Answer 132

8

A code uses three of the digits 1 to 5. No digit is used twice. Lily says there are 5 × 5 × 5 = 125 codes. Explain her mistake and find the number of codes.

no repeats: each box one smaller

5 × 4 × 3

Answer 60

The product rule for counting *further practice*

ANSWERS

9

A pizza is one base, one cheese and one topping. There are 3 bases, 2 cheeses and 6 toppings.
How many different pizzas are there?

3 × 2 × 6

Answer 36

10

A label is two letters from A to Z, then one digit from 0 to 9.
Letters can repeat. How many labels are there?

26 × 26 × 10

Answer 6760

11

Six runners are in a race. In how many ways can first, second and third place be filled?

6 × 5 × 4

Answer 120

12

A café has 4 kinds of bread and some fillings. A sandwich is one bread and one filling. There are 28 different sandwiches.
How many fillings are there?

4 × ? = 28

Answer 7

13

How many 3 digit numbers can be made from the digits 2, 5, 7 and 8, with no digit used twice?

4 × 3 × 2

Answer 24

14

How many of the numbers in question 13 are even?

last digit 2 or 8: 2 choices

3 × 2 × 2

Answer 12

15

A password is three different letters from A to H. How many passwords are there?

8 × 7 × 6

Answer 336

16

Code A is two letters from A to Z, which can repeat. Code B is three different digits from 0 to 9. Which type has more codes? Show how you know.

A: 26 × 26 = 676

B: 10 × 9 × 8 = 720

Answer Code B