

The Product Rule for Counting *stretch*

ANSWERS 

1



An outfit is a top, trousers and shoes, with or without a hat. Kim has 4 tops, 3 pairs of trousers, 5 pairs of shoes and 2 hats.

How many different outfits can she make?

hat: 2 hats or no hat = 3 choices

$$4 \times 3 \times 5 \times 3$$

180

Answer

2



How many odd 3-digit numbers are there?

first digit 1 to 9, last digit 1, 3, 5, 7 or 9

$$9 \times 10 \times 5$$

450

Answer

3



A password is 2 different letters from A to Z, then 3 digits from 0 to 9.

Digits can repeat.

How many passwords are there?

$$26 \times 25 \times 10 \times 10 \times 10$$

650 000

Answer

4



Codes are made from 3 different letters, chosen from a set of letters.

There are 210 possible codes.

How many letters are in the set?

$$n \times (n - 1) \times (n - 2) = 210$$

$$7 \times 6 \times 5 = 210$$

7

Answer

5



A coin is flipped 6 times and the results are written in order, such as HHTHTT.

How many different results are possible?

$$2 \times 2 \times 2 \times 2 \times 2 \times 2$$

64

Answer

6



Jo says there are $10 \times 10 \times 10 = 1000$ 3-digit numbers, because each digit can be 0 to 9.

Explain Jo's mistake and give the right number.

the first digit cannot be 0

$$9 \times 10 \times 10$$

900

Answer

7



2-digit numbers are made from the digits 1, 3, 5 and 7. No digit is used twice.

How many of the numbers are greater than 50?

first digit 5 or 7: 2 choices

$$2 \times 3$$

6

Answer

8



A lock has 4 dials, each showing 0 to 9. A thief tries one code every 3 seconds.

Can the thief try every code in 8 hours? Show how you know.

$$10 \times 10 \times 10 \times 10 = 10\,000 \text{ codes}$$

$$10\,000 \times 3 = 30\,000 \text{ s} = 500 \text{ min}$$

No, it takes 8 h 20 min

Reason