Name:

Exam Style Questions

Product Rule for Counting

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

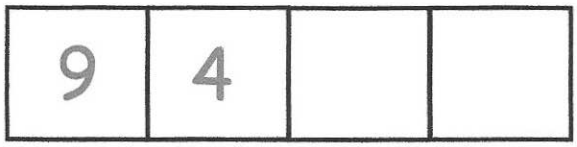
www.corbettmaths.com/contents

Video 383

1. Benjamin picks a 4 digit pin for his debit card.

Each digit is a number is 0 to 9.
Benjamin can repeat digits.

His pin starts with 9 4



(a) How many possible codes are there?

00 → 99

100

(1)

Megan creates a 4-digit code for her debit card.
The first digit is 2
The 4-digit code is **odd**.

(b) How many possible codes are there?

1st 2nd 3rd 4th

1 x 10 x 10 x 5

500

(2)

2. In a school there are 20 students in Year 4 and 18 students in Year 5.
The headteacher wants to interview one Year 4 student and one Year 5 student.

The headteacher says,

"There are 360 different ways to choose one Year 4 student and one Year 5 student."

Shows the headteacher is correct.

$20 \times 18 = 360$

(1)

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3. A coach is designing a new football strip.

He has a choice of 4 different pairs of socks, 3 different pairs of shorts and 11 different shirts.

How many different strips are possible?

$4 \times 3 \times 11 = 132$

132

(2)

4. 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?

1st 2nd 3rd

7 x 10 x 2

140

.....

(2)

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5. Erin wants to buy a rug and a mirror.
In the furniture there are 16 different rugs and some different types of mirror.

There are 144 different ways to choose one rug and one mirror.

How many different types of mirror are there?

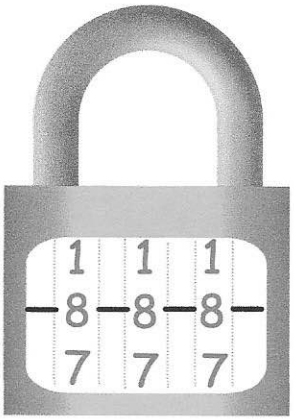
144 ÷ 16 = 9

9

.....

(2)

6. There are three dials on a combination lock.
Each dial can be set to 1, 2, 3, 4, 5, 6, 7 or 8.



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

$8 \times 8 \times 8 = 512$

512
.....
(2)

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

$8 \times 7 \times 6 = 336$

336
.....
(2)

7. Jacob picks a 5-digit **even** number.

The first digit is a prime number. 2, 3, 5, 7
The third digit is odd.
The four digit is 8

How many different 5-digit number could he pick?

1st 2nd 3rd 4th 5th

4 x 10 x 5 x 1 x 5

1000

(3)

8. Orla picks a 4-digit **even** number.

The first digit is greater than 6 ~~7~~ 8 ~~9~~
The second digit is half of the first digit.
The third digit is less than 6

How many different numbers could she pick?

1st 2nd 3rd 4th

1 x 1 x 6 x 5

30

(3)

9. At Corbett's Cafe there are

7 starters
16 main dishes
11 desserts

A meal voucher allows a customer to pick one starter, one main dish and one dessert for £10

(a) How many different ways are there to choose a meal?

7 x 16 x 11

1232

(2)

Three of the starters and four of the main dishes contain fish.
A different customer uses their meal voucher but they **do not like fish**.

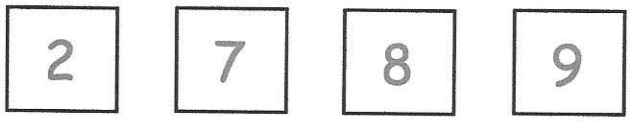
(b) How many different meal combinations can they choose?

4 x 12 x 11

528

(2)

10. Jackson makes 4-digit numbers using all of these cards.



How many different numbers greater than 6000 can Jackson make?

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

18

.....

(3)

11. In a gym there are

7 exercise classes on a Monday
14 exercise classes on a Wednesday
12 exercise classes on a Friday

Max is going to attend either

a class on Monday and a class on Wednesday
or a class on Monday and a class on Friday
or a class on Monday, Wednesday and Friday.

Show there are 1358 different ways to pick which exercise classes he is going to attend.

$7 \times 14 = 98$

$7 \times 12 = 84$

$7 \times 14 \times 12 = 1176$

$98 + 84 + 1176 = 1358$

(3)

12. James is creating a 6-digit code to lock his iPad.

He only uses the digits 1, 2, 3, 4, 5 and 6.
He uses each digit once.

(a) How many possible codes can James create?

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

720

(2)

Kelvin also creates a 6-digit code.
He picks his digits from the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.

For the first two digits of his code he uses a multiple of 15. 15 30 45 60 75 90
For the middle two digits of the code, he repeats the same digit. 10
For the last two digits, Kelvin uses an even number between 25 and 45.

(b) How many possible codes can Kelvin create?

1st 2nd 3rd 4th 5th 6th

$6 \times 10 \times 10$

600

(2)

13. In a class, there are twelve girls and ten boys.
Four of the girls and two of the boys are left handed.

8 right handed girls 8 right handed boys

The teacher picks one girl and one boy at random.

What percentage of the possible pairings of students are **both** the students right handed?

$12 \times 10 = 120$

$8 \times 8 = 64$

$\frac{64}{120} = 0.5\dot{3}$

$53\frac{1}{3}\%$

.....

(3)

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14. Chris makes 5-digit numbers using all of the cards below.

1	2	3	5	8

How many different numbers less than 70000 can he make?

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

96

.....

(3)

15. In Year 10 there are 60 girls.
Two of the girls are going to be chosen at random to go on a trip.

Work out the number of different pairs that can be chosen.

$60 \times 59 = 3540$

$3540 \div 2 = 1770$

1770

.....

(2)

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16. How many odd numbers greater than 40,000 can be created using these digits

1 2 6 7 8

using each digit only once.

Beginning with 6 & ending with 1

(6) $1 \times 3 \times 2 \times 1 \times 1 = 6$

Beginning with 6 & ending with 7

$1 \times 3 \times 2 \times 1 \times 1 = 6$

(8) Beginning with 8

12

(7) Beginning with 7, ending with 1

$1 \times 3 \times 2 \times 1 \times 1 = 6$

30

.....

(3)

17. A pizza parlour sells 10 different pizza toppings.

Grace orders a pizza with 3 different pizza toppings.

How many different pizzas can Grace order?

$$\frac{10 \times 9 \times 8}{3 \times 2 \times 1} = 120$$

120

(4)