Counting

Click on a question number to see how your answers were marked and, where available, full solutions.

Question Number	Score
Question 1	1 / 1
Question 2	1 / 1
Question 3	1 / 1
Question 4	1 / 1
Question 5	1 / 1
Question 6	1 / 1
Question 7	1 / 1
Question 8	1 / 1
Total	**8 / 8 (100%)**

Congratulations, you passed this quiz with a sufficient score. You may include this attempt as part of your self-assessment evidence.

Make sure that you click on "Print this results summary" and save to pdf, so that everything can be read clearly. Do not navigate away from this page before you have saved your result.

Performance Summary

Exam Name:	Counting
Session ID:	15425323125
Exam Start:	Fri Jun 07 2024 17:04:09
Exam Stop:	Fri Jun 07 2024 17:08:57
Time Spent:	0:04:48

Question 1

How many integers between 100 and 999 (3 digits) contain only the digits 2,3,6 and 9?

| 64 | ✔ | Expected answer: 64 |

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

There are 3 choices to make, and each choice is independent of the other choices. We need to apply the product rule. For each position, we have 4 possibilities. Therefore, applying the product rule, we find that there are $4^3 = 64$ possible numbers.

Question 2

How many 10 letter words can you make from the letters A,B and C?

| 59049 | ✔ | Expected answer: 59049 |

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

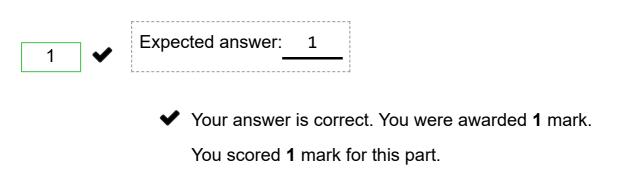## Advice

There are 10 choices to make, and each choice is independent of the other choices. We need to apply the product rule. For each position, we have 3 possibilities. Therefore, applying the product rule, we find that there are $3^{10} = 59049$ possible words.

Question 3

How many integers between 10000 and 99999 (5 digits), without repeated digits, contain only the digits 3,4,6,8 and 9 and the digits appear only once each, and in increasing order?

| 1 | ✔ |

Expected answer: 1

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

We need to pick 5 digits out of 5. Since we re-order the digits, the original order in which we pick them does **not** matter. Therefore we need to find 5-combinations out of 5 choices. The number of such combinations is

$$C(5, 5) = \frac{5!}{0! \times 5!} = 1$$

.

Question 4

How many integers between 10000 and 99999 (5 digits), contain only the digits 2,3,4,5,6,7 and 8, and no digit appears twice?

2520　✔　Expected answer:　2520

✔　Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

We need to pick 5 digits out of 7. Since the order matters, we need to find 5-permutations out of 7 choices. The number of such permutations is

$$\frac{7!}{(7-5)!} = 2520$$

.

Question 5

How many integers between 100 and 999 (3 digits), contain only the digits 1,2,3,4,5,7 and 8, and no digit appears twice?

210　✔　Expected answer:　210

✔　Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

We need to pick 3 digits out of 7. Since the order matters, we need to find 3-permutations out of 7 choices. The number of such permutations is

$$\frac{7!}{(7-3)!} = 210$$

.

Question 6

How many 4 letter words can you make from the letters A,B,C,D,E,F,G and H, where letters cannot be repeated and are in alphabetical order?

| 70 | ✔ | Expected answer: 70 |

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

We need to pick 4 letters out of 8. Since we re-order the letters, the original order in which we pick them does **not** matter. Therefore we need to find 4-combinations out of 8 choices. The number of such combinations is

$$C(8, 4) = \frac{8!}{(4!)^2} = 70$$

.

Question 7

How many integer solutions are there to the equation:

$$x_1 + x_2 + x_3 + x_4 = 14?$$

680 ✔

Expected answer: __680__

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

The number of different solutions to this equation is the same as picking 14 objects out of a set of 4 objects, where repetition is allowed. Indeed: x_1 corresponds to how many times the first object was picked, x_2 how many times the second object was picked, etc.

This number is $C(14 + 4 - 1, 14) = C(17, 14) = 680$.

Question 8

How many integer solutions are there to the equation:

$$x_1 + x_2 + x_3 + x_4 = 17?$$

1140 ✔

Expected answer: __1140__

✔ Your answer is correct. You were awarded **1** mark.

You scored **1** mark for this part.

Score: 1/1 ✔

Advice

The number of different solutions to this equation is the same as picking 17 objects out of a set of 4 objects, where repetition is allowed. Indeed: x_1 corresponds to how many times the first object was picked, x_2 how many times the second object was picked, etc.

This number is $C(17 + 4 - 1, 17) = C(20, 17) = 1140$.