



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Product Rule for Counting · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Product Rule for Counting

Total marks available: 124

● Product Rule for Counting

Q1

[3 marks]

A phone case can be customised with 2 choices of colour, 3 choices of pattern, 3 choices of trim, and 2 choices of engraving. How many different phone cases can be made?

Q2

[4 marks]

A vehicle code is made of 2 letters (chosen from the 26 letters of the alphabet) followed by 2 digits (chosen from 0-9). Letters and digits can each be repeated. How many different codes are possible?

Q3

[4 marks]

A vehicle code is made of 2 letters (chosen from the 26 letters of the alphabet) followed by 4 digits (chosen from 0-9). Letters and digits can each be repeated. How many different codes are possible?

Q4

[3 marks]

A phone case can be customised with 2 choices of colour, 2 choices of pattern, 3 choices of trim, and 3 choices of engraving. How many different phone cases can be made?

Q5

[3 marks]

A phone case can be customised with 2 choices of colour, 5 choices of pattern, 2 choices of trim, and 4 choices of engraving. How many different phone cases can be made?

Q6

[4 marks]

A vehicle code is made of 2 letters (chosen from the 26 letters of the alphabet) followed by 3 digits (chosen from 0-9). Letters and digits can each be repeated. How many different codes are possible?

Q7

[4 marks]

A vehicle code is made of 3 letters (chosen from the 26 letters of the alphabet) followed by 3 digits (chosen from 0-9). Letters and digits can each be repeated. How many different codes are possible?

Q8

[3 marks]

A phone case can be customised with 3 choices of colour, 4 choices of pattern, 2 choices of trim, and 2 choices of engraving. How many different phone cases can be made?

Q9

[3 marks]

A phone case can be customised with 4 choices of colour, 3 choices of pattern, 4 choices of trim, and 3 choices of engraving. How many different phone cases can be made?

Q10

[3 marks]

A phone case can be customised with 5 choices of colour, 3 choices of pattern, 3 choices of trim, and 3 choices of engraving. How many different phone cases can be made?

Q11

[4 marks]

In a competition with 10 contestants, in how many different ways can 1st, 2nd, and 3rd place be awarded, assuming no ties?

Q12

[4 marks]

5 distinct people, including Hana, are arranged in a row of 5 seats. Hana must sit in the seat at the left-hand end of the row. In how many different ways can the row be arranged?

Q13

[4 marks]

In a competition with 9 runners, in how many different ways can 1st, 2nd, and 3rd place be awarded, assuming no ties?

Q14

[4 marks]

In a competition with 10 people, in how many different ways can 1st, 2nd, and 3rd place be awarded, assuming no ties?

Q15

[4 marks]

5 distinct people, including Fiona, are arranged in a row of 5 seats. Fiona must sit in the seat at the left-hand end of the row. In how many different ways can the row be arranged?

Q16

[4 marks]

5 distinct people, including Eli, are arranged in a row of 5 seats. Eli must sit in the seat at the left-hand end of the row. In how many different ways can the row be arranged?

Q17

[4 marks]

8 distinct people, including Ivo, are arranged in a row of 8 seats. Ivo must sit in the seat at the left-hand end of the row. In how many different ways can the row be arranged?

Q18

[4 marks]

7 distinct people, including Fiona, are arranged in a row of 7 seats. Fiona must sit in the seat at the left-hand end of the row. In how many different ways can the row be arranged?

Q19

[4 marks]

In a competition with 9 students, in how many different ways can 1st, 2nd, and 3rd place be awarded, assuming no ties?

Q20

[4 marks]

In a competition with 10 friends, in how many different ways can 1st, 2nd, and 3rd place be awarded, assuming no ties?

Q21

[5 marks]

A vehicle registration code of 5 different digits is formed from the digits 1-9, with no digit repeated. The first digit must be one of 4 specific allowed digits. How many different codes are possible?

Q22

[5 marks]

A vehicle registration code of 5 different digits is formed from digits 0-9, with no digit repeated. The first digit must be one of 4 specific allowed digits. How many different codes are possible?

Q23

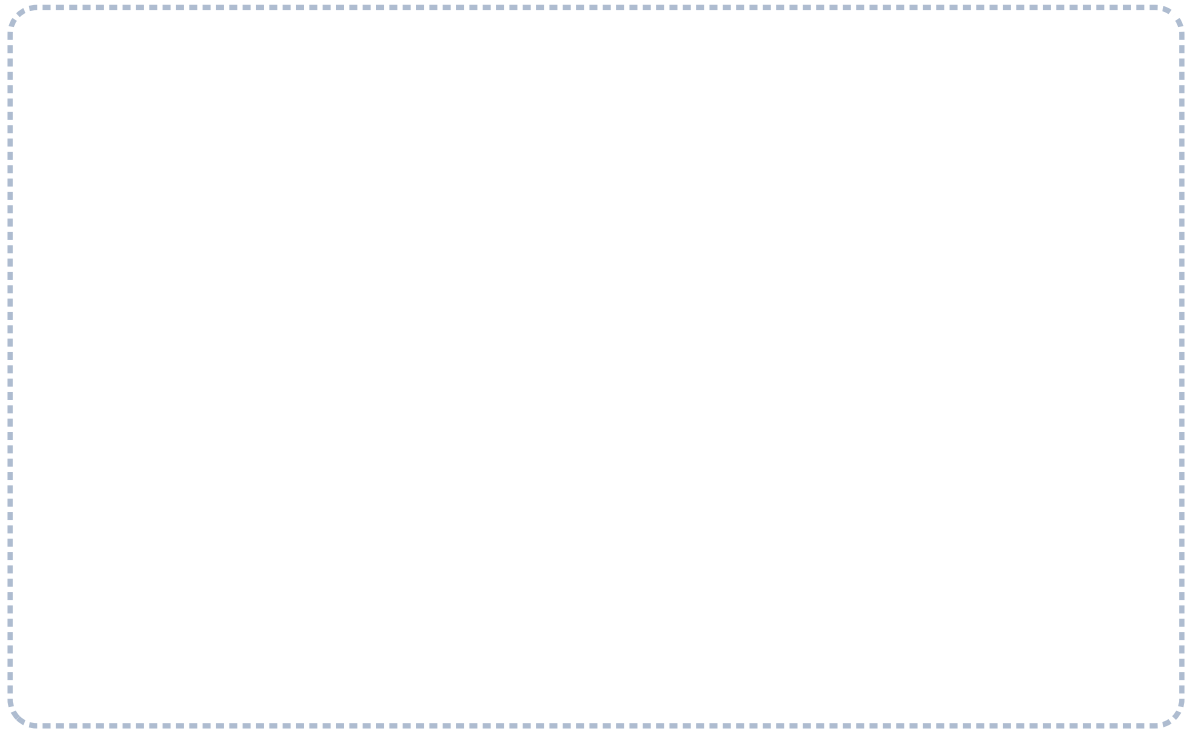
[5 marks]

6 distinct people, including Amir and Chen, are arranged in a row of 6 seats. In how many different ways can they be arranged so that Amir and Chen are NOT sitting next to each other?

Q24

[5 marks]

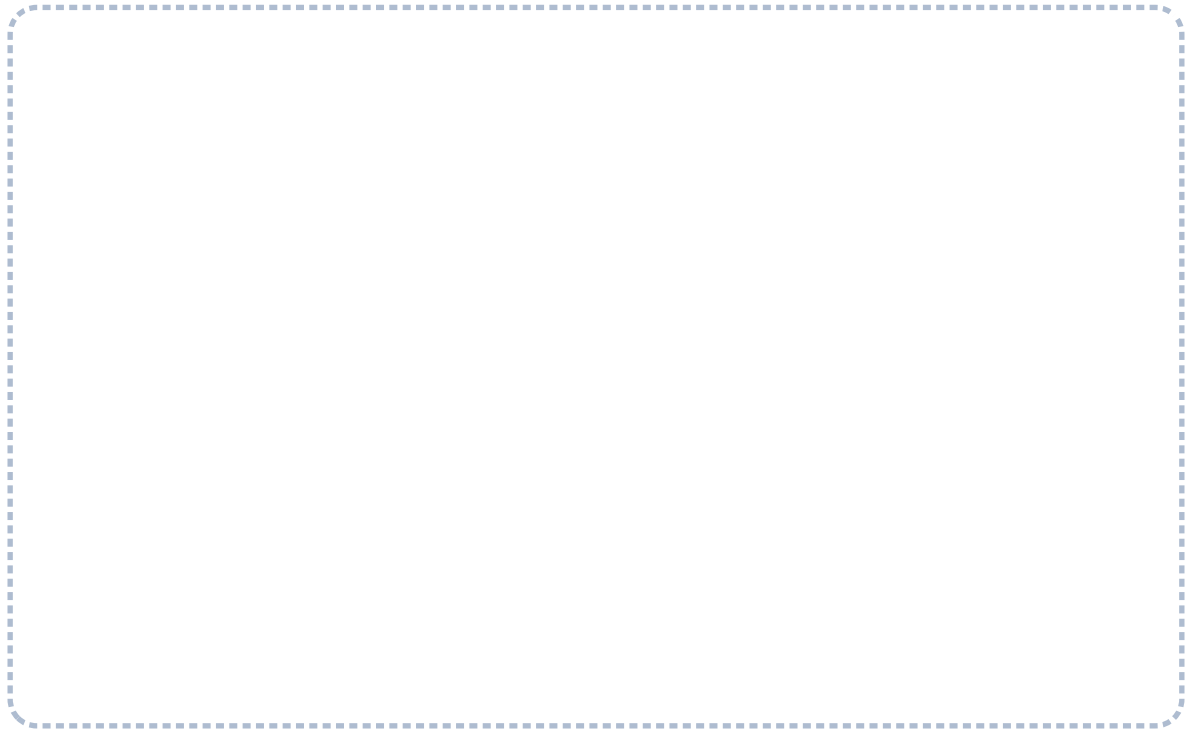
6 distinct people, including Hana and Chen, are arranged in a row of 6 seats. In how many different ways can they be arranged so that Hana and Chen are NOT sitting next to each other?



Q25

[5 marks]

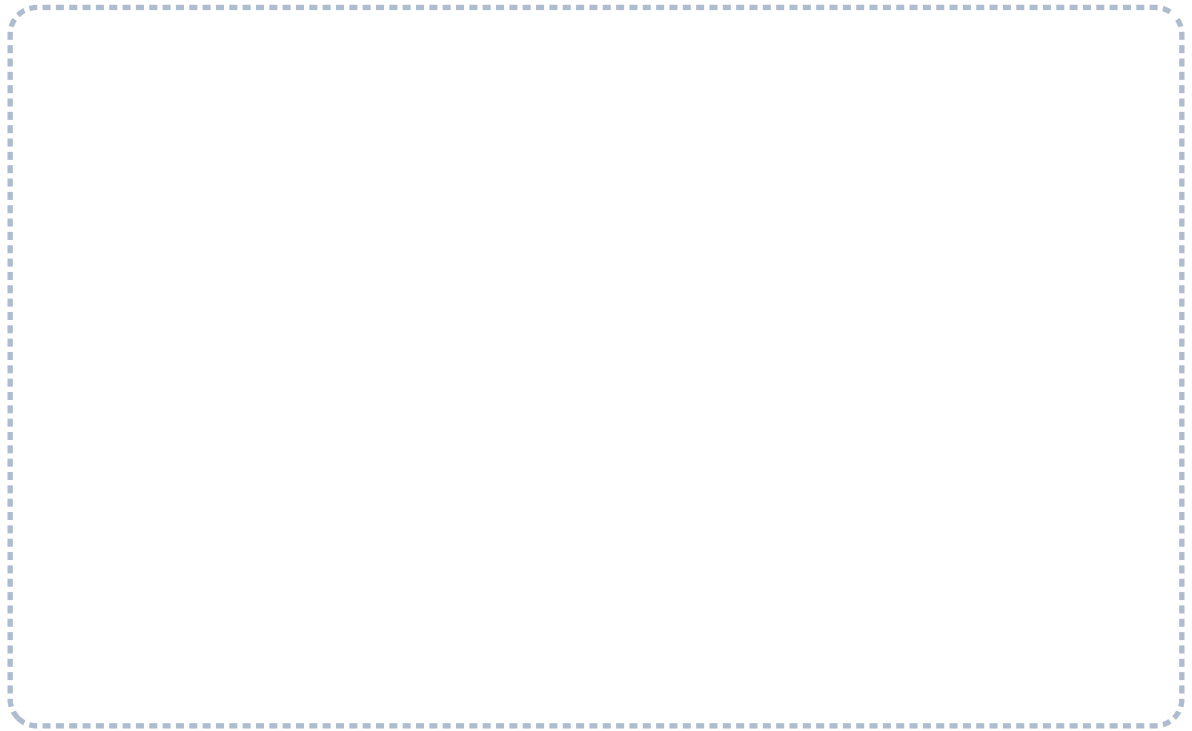
5 distinct people, including Jade and Ivo, are arranged in a row of 5 seats. In how many different ways can they be arranged so that Jade and Ivo are NOT sitting next to each other?



Q26

[5 marks]

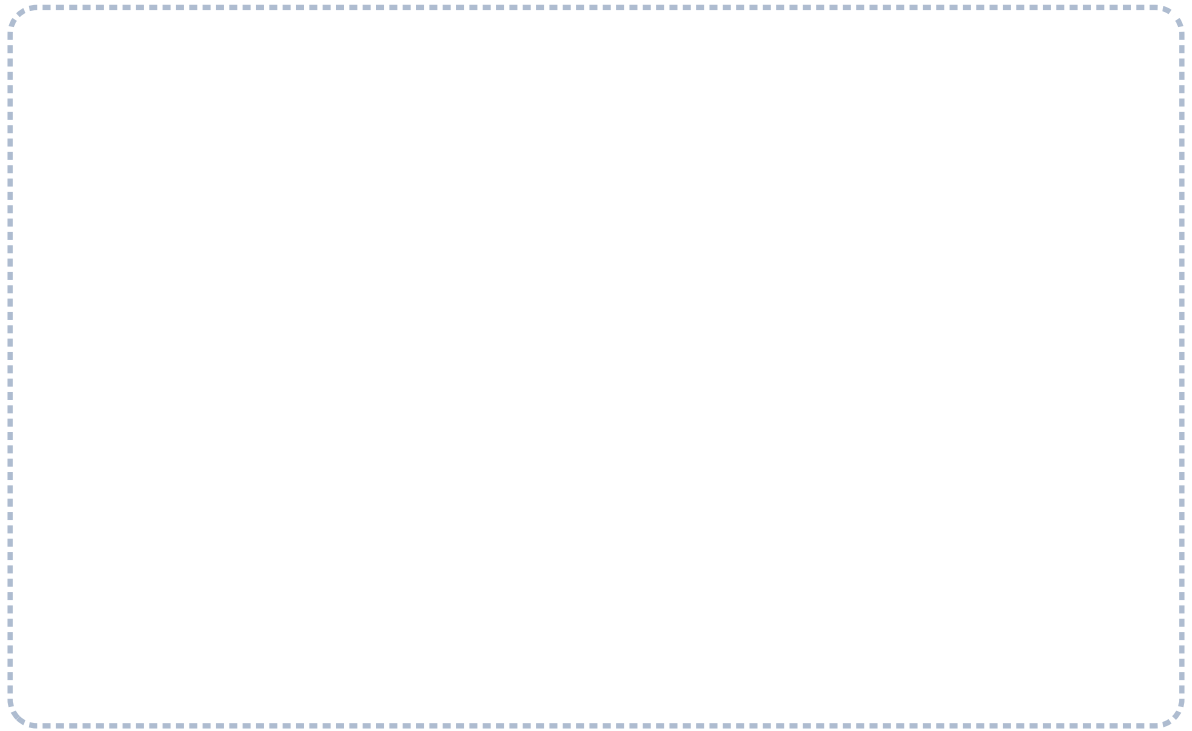
6 distinct people, including Beth and Fiona, are arranged in a row of 6 seats. In how many different ways can they be arranged so that Beth and Fiona are NOT sitting next to each other?



Q27

[5 marks]

7 distinct people, including Kofi and Jade, are arranged in a row of 7 seats. In how many different ways can they be arranged so that Kofi and Jade are NOT sitting next to each other?



Q28

[5 marks]

A vehicle registration code of 5 different digits is formed from digits 0-9, with no digit repeated. The first digit must be one of 3 specific allowed digits. How many different codes are possible?

Q29

[5 marks]

8 distinct people, including Beth and Gus, are arranged in a row of 8 seats. In how many different ways can they be arranged so that Beth and Gus are NOT sitting next to each other?

Q30

[5 marks]

8 distinct people, including Eli and Leah, are arranged in a row of 8 seats. In how many different ways can they be arranged so that Eli and Leah are NOT sitting next to each other?