6.3 The Product Rule for Counting: 30-minute Pack

Total Marks

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A suitcase has a combination lock with 3 dials. Each dial can be set to any digit from 0 to 9.

(a) Work out the total number of possible codes if digits can be repeated. **(2)**

.....

(b) Work out the total number of possible codes if no digit can be repeated. **(2)**

.....

(Total for Question 1 is 4 marks)

---

2 An access code is made from 1 letter of the alphabet (26 letters) followed by 1 digit (0 to 9).
Work out the number of different access codes possible.

(Total for Question 2 is 2 marks)

---

3 Grace tosses 3 fair coins, one after another.
Work out the number of different sequences of heads and tails possible.

(Total for Question 3 is 2 marks)

© Revision Library | revisionlibrary.co.uk

4 A PE kit is made from one shirt (4 colours available), one pair of shorts (3 colours available) and one pair of socks (2 colours available).
Work out the number of different PE kits possible.

(Total for Question 4 is 2 marks)

---

5 A locker code is made from 2 digits, each chosen from 1, 2, 3, 4, 5. Digits may be repeated.
Work out the number of different codes possible.

(Total for Question 5 is 2 marks)

---

6 A different locker code is made from 2 digits, each chosen from 1, 2, 3, 4, 5, but no digit may be repeated.
Work out the number of different codes possible.

(Total for Question 6 is 2 marks)

---

7 A gate code is made from 2 letters, each chosen from A, B, C, D. Letters may be repeated.
Work out the number of different gate codes possible.

(Total for Question 7 is 2 marks)

© Revision Library | revisionlibrary.co.uk

8 The word MATHS has 5 different letters.

(a) Work out the number of different ways the 5 letters can be arranged. **(2)**

.....

(b) Work out the number of these arrangements that begin with the letter A. **(2)**

.....

(Total for Question 8 is 4 marks)

---

9 A shoe shop sells trainers in 4 styles and 6 colours. Every style is available in every colour, except that style D is not available in gold or in silver.

(a) Work out how many style-and-colour combinations would be possible if every style were available in every colour. **(1)**

.....

(b) Work out the actual number of style-and-colour combinations available, given that style D is not available in gold or in silver. **(3)**

.....

(Total for Question 9 is 4 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 6.3 The Product Rule for Counting: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) 10 x 10 x 10 oe seen **M1**

(a) 1000 cao **A1**

(a) Answer: 1000

(b) 10 x 9 x 8 oe seen **M1**

(b) 720 cao **A1**

(b) Answer: 720

Question 2

26 * 10 oe seen **M1**

260 cao **A1**

Answer: 260

Question 3

2 * 2 * 2 oe seen **M1**

8 cao **A1**

Answer: 8

Question 4

4 * 3 * 2 oe seen **M1**

24 cao **A1**

Answer: 24

Question 5

5 * 5 oe seen **M1**

25 cao **A1**

Answer: 25

Question 6

5 * 4 oe seen **M1**

20 cao **A1**

Answer: 20

Question 7

4 * 4 oe seen **M1**

16 cao **A1**

Answer: 16

Question 8

(a) 5 x 4 x 3 x 2 x 1 oe seen **M1**

(a) 120 cao **A1**

(a) Answer: 120

(b) fixes A in the first position and arranges remaining 4 letters: 4 x 3 x 2 x 1 oe **M1**

(b) 24 cao **A1**

(b) Answer: 24

Question 9

(a) 24 cao **B1**

(a) Answer: 24

(b) 24 (or their (a)) identified as the unrestricted total, ft **M1**

(b) identifies that 2 combinations must be removed (style D with gold, style D with silver) **M1**

(b) 22 cao **A1**

(b) Answer: 22

© Revision Library | revisionlibrary.co.uk