Product Rule for Counting Exam Practice

Choosing from Distinct groups of items

Q1. On a menu, there are 8 starters and 11 main dishes. Work out the number of possible ways of choosing a starter and a main dish.

(2 marks)

Q2. For a new play, a theatre company needs to choose a girl and a boy from a choice of 15 girls and 21 boys. Work out the number of possible ways of choosing the girl and the boy.

(2 marks)

Q3. To choose her outfit for the next day, Sally must select a jacket, a skirt and a pair of shoes. If she has 6 jackets, 9 skirts and 7 pairs of shoes in her wardrobe, work out the number of possible different outfits she could wear.

(2 marks)

Q4. Harry plays a game using a 6-sided dice, a spinner numbered 1 to 10 and a coin labelled heads and tails. If he throws a prime number on the dice, an odd number on the spinner and a head, he wins a prize. Work out the number of outcomes which will earn him a prize.

(3 marks)

Q5. There are 8 brands of biscuit to choose from and several different types of cake at a party. There are a total of 112 different ways to choose a biscuit and a cake. Marc thinks that there 12 different types of cake. Do you agree? Explain your choice.

(2 marks)

Choosing within one group of items

Q6. At a business meeting, there are 14 people. Everybody shakes hands once with each of the other people. How many handshakes are there in total?

(2 marks)

Q7. In a classroom, two pupils are selected to be on the school council. If there are 20 pupils in the class, work out the number of ways of choosing the pupils for the council.

(2 marks)

Q8. In a word game, Mike must choose any two letters from the alphabet, which contains 26 letters. They can be the same letter each time if he wishes, or otherwise. How many different ways can he do this?

(2 marks)

Applied Mixed Practice Problems

Q9. Here is the menu in a restaurant. All vegetarian options are marked "V".

Starter:		Main:	
Melon	V	Bean fritter	V
Samosa		Omelette	
Fried Mushrooms	V	Ham & eggs	
Garlic Bread	V	5 bean chilli	V
Tomato Soup	V	steak & chips	
Smoked Salmon		Fried camembert	V

(i) Tim is a strict vegetarian. He orders a meal by taking a starter and a main course. Work out the number of different meals he could order.

(2 marks)

(ii) Charles orders by a meal by taking a starter, a main and a dessert. The waiter tells him there are a choice of 6 desserts available. Assuming that Charles does not have a vegetarian main dish, how many different meals could he order?

(2 marks)

Q10. Tara deals a pair of 2 cards from a pack of 52 cards to Mary. How many different possible pairs of cards could Mary get?

(2 marks)

Q11. In a cricket league consisting of 20 teams, each team must play against every other team. How many matches will take place?

(2 marks)

Q12. In a school band there are 4 string instrument players, 5 brass instrument players and 4 different woodwind instrument players.

The music teacher wants to put together a pair of musicians consisting of a brass player and a woodwind player, or a string player and a woodwind player. How many different different ways are there of choosing the pair of instruments?

(3 marks)