



Class 9 Maths – Chapter 7



Exercise 7.4 – Important Questions with Answer Key

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Exercise 7.4 has **2 questions**, focusing on **tree diagrams**, **sample spaces** and **probability of multi-step experiments**.

1. 🍎 Fruit Baskets

There are two fruit baskets:

Basket A: 1 apple and 2 oranges

Basket B: 1 banana and 1 mango

One fruit is randomly picked from each basket.

(i) 🌳 Draw a tree diagram

From Basket A:

- 🍎 Apple
- 🍊 Orange₁
- 🍊 Orange₂

Each branch then divides into:

- 🍌 Banana
- 🥭 Mango

So there are **6 equally likely outcomes**:

(Apple, Banana)

(Apple, Mango)

(Orange₁, Banana)

(Orange₁, Mango)

(Orange₂, Banana)

(Orange₂, Mango)

The textbook's tree-diagram approach treats the two oranges as separate equally likely selections.

(ii) List the sample space

S = {

(Apple, Banana),

(Apple, Mango),

(Orange₁, Banana),

(Orange₁, Mango),

(Orange₂, Banana),

(Orange₂, Mango)

}

Therefore:

$$n(S) = 6$$

 **Answer:**

6 possible outcomes

(iii) Probability of picking one apple and one banana

Favourable outcome:

(Apple, Banana)

Number of favourable outcomes = **1**

Total outcomes = **6**

Therefore:

$$P(\text{Apple and Banana}) = 1/6$$

✓ **Answer:**

$1/6 \approx 0.167$ or **16.7%**

2. **Pen-Colour Experiment**

A box contains:

-  **3 red pens**
-  **4 black pens**
-  **2 green pens**

You pick one pen randomly and **put it back**.

Then your friend picks one pen.

(i) **Possible outcomes and tree diagram**

Because the pen is replaced, the probabilities remain the same for the second pick.

First pick:

-  Red = $3/9 = 1/3$
-  Black = $4/9$
-  Green = $2/9$

Each of these branches again divides into:

-  Red
-  Black
-  Green

Therefore there are:

$3 \times 3 = 9$ possible colour outcomes

Sample space:

S = {
(Red, Red),
(Red, Black),
(Red, Green),
(Black, Red),
(Black, Black),
(Black, Green),
(Green, Red),
(Green, Black),
(Green, Green)
}

 **Answer:**

9 possible colour outcomes

(ii) Probability that both pick the same colour

The favourable outcomes are:

-  **(Red, Red)**
-  **(Black, Black)**
-  **(Green, Green)**

We calculate each probability because the colours are **not equally likely**.

Red–Red:

$$P(RR) = 3/9 \times 3/9 = 9/81$$

Black–Black:

$$P(BB) = 4/9 \times 4/9 = 16/81$$

Green–Green:

$$P(GG) = 2/9 \times 2/9 = 4/81$$

Therefore:

$$P(\text{same colour})$$

$$= 9/81 + 16/81 + 4/81$$

$$= 29/81$$

$$\approx 0.358$$

$$\approx 35.8\%$$

 **Answer:**

$$P(\text{same colour}) = 29/81 \approx 35.8\%$$

The textbook specifically asks students to use the tree diagram to determine this probability; because the pen is replaced, the second selection has the same probabilities as the first.



COMPLETE ANSWER KEY

Question	Answer
n	
1(i)	6 equally likely paths
1(ii)	6 outcomes
1(iii)	$1/6 \approx 16.7\%$
2(i)	9 possible colour outcomes
2(ii)	$29/81 \approx 35.8\%$

★ Chapter 7.4 Must Remember

🌳 **Tree diagram** → shows all possible outcomes of a multi-step experiment.

📋 **Sample space** → all possible outcomes.

🎯 **Probability** = Favourable outcomes ÷ Possible outcomes **when outcomes are equally likely**.

↺↻ **With replacement** → probabilities remain unchanged for the next selection.

📌 In Question 2, the outcomes **are not equally likely**, so add the probabilities of the three matching-colour paths rather than simply doing **3/9**.