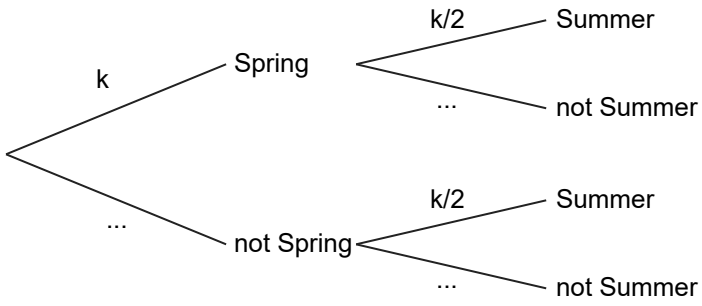
Homework — Part 2: Exam practice (IB past papers)

10 real IB questions (only the parts about today's lesson), Paper 1 and Paper 2 mixed. Total: **22 marks**. Paper 1 — no calculator.

1. Paper 1 IB May 2024

A species of bird can nest in two seasons: Spring and Summer. The probability of nesting in Spring is k. The probability of nesting in Summer is $\frac{k}{2}$. This is shown in the following tree diagram.



(a) Complete the tree diagram to show the probabilities of not nesting in each season. Write your answers in terms of k. **[2]**

2. Paper 2 IB May 2025

Lynn is playing a game with two unbiased six-sided dice, each with faces marked with the integers from 1 to 6. In each round, she throws both dice once. The outcomes can be displayed in a 6 × 6 sample space diagram.

Lynn scores points according to the following rules. If the two dice show the same score, she scores 10 points. If the two dice show scores which have a difference of one, for example the scores 4 and 5 in any order, she scores 5 points. Otherwise, she scores 0 points.

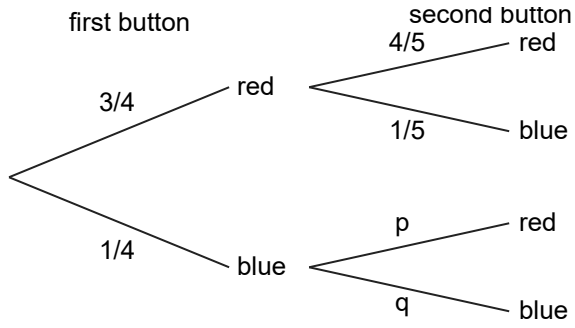
	1	**2**	**3**	**4**	**5**	**6**
1	10	5				
2	5					
3						
4						
5						
6						

(a) **Show that** the probability that Lynn scores 5 points in one round is $\frac{5}{18}$. **[2]**

(b) **Find** the probability that Lynn scores no points in one round. **[2]**

3. Paper 1 IB May 2024

A bag contains buttons which are either red or blue. Initially, the bag contains three red buttons and one blue button. Francine randomly selects one button from the bag. She then replaces the button and adds one extra button of the same colour. For example, if she selects a red button, she then replaces it and adds one extra red button so that the bag then contains four red buttons and one blue button. Francine then randomly selects a second button from the bag. The following tree diagram represents the probabilities of the first two selections.



(a) **Find** the value of p and the value of q. [2]

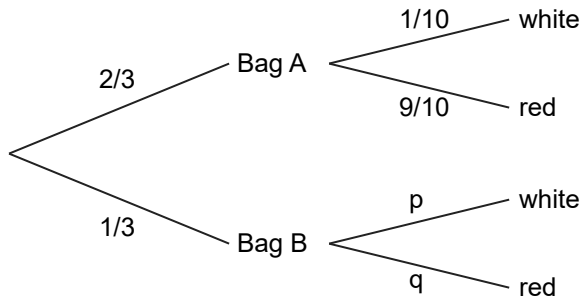
4. Paper 2 IB May 2026

Jacinta has a bag of counters which are coloured either red, blue or yellow. The bag contains exactly 12 yellow counters. The number of red counters is the same as the number of blue counters. The probability that a counter taken at random is yellow is 0.4.

(a) **Show that** there are 9 red counters in the bag. [2]

5. Paper 1 IB May 2026

A game is played where a biased coin is tossed and then a ball is drawn from one of two bags. If the player obtains a head, then a ball is drawn from Bag A, otherwise a ball is drawn from Bag B. The probability of obtaining a head is $\frac{2}{3}$. Bag A contains 1 white ball and 9 red balls. Bag B contains 4 white balls and 6 red balls. This is shown in the following tree diagram.



(a) **Write down** the value of p and the value of q. [2]

6. Paper 2 IB May 2023

In a large city, 160 people were surveyed. Of those, 60 were children (C) and the rest adults (A). Each person in the survey was asked whether they preferred milk chocolate (M) or dark chocolate (D). It was found that 48 of the children preferred milk chocolate. This information is shown in the following table.

	M **(milk chocolate)**	D **(dark chocolate)**	**Total**
C **(children)**	48	p	60
A **(adults)**	x	y	q

(a) **Find** the value of (i) p; (ii) q. **[2]**

7. Paper 2 IB November 2024

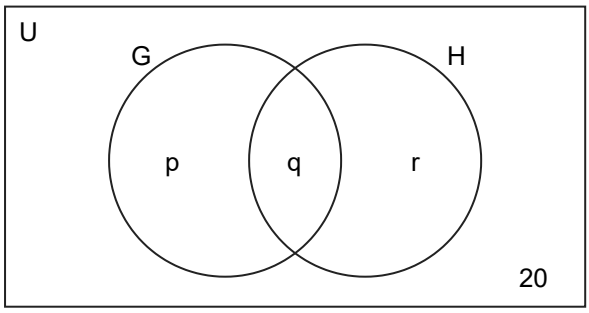
MyLife is a social media platform with 89.8 million users, all aged 12 years old and above. The following frequency table shows the number of users by age group.

Age, a **(years)**	**Millions of users**
$12 \leq a < 18$	5.8
$18 \leq a < 35$	42.7
$35 \leq a < 55$	26.3
$55 \leq a < 75$	12.9
$75 \leq a < 95$	2.1
Total	**89.8**

(a) **Find** the percentage of *MyLife* users aged 55 years or older. **[1]**

8. Paper 2 IB May 2026

A school surveys 150 students about their subject selection. From the survey, 90 students study geography G and 70 students study history H. 20 students said they do not study either. This is shown in the following Venn diagram, where $p, q, r \in \mathbb{Z}^+$.



(a) (i) **Find** the value of q. **[1]**

(ii) **Find** the value of p and the value of r. **[2]**

(b) **Find** the probability that a randomly selected student studies both geography and history. **[1]**

9. Paper 2 IB May 2025

A water theme park has a ride called Daifong. From previous records, it is expected that 37% of the visitors on any particular day will ride Daifong. On Saturday, 1900 people will visit the theme park.

(b) **Find** the number of people that are expected to ride Daifong. **[2]**

10. Paper 2 IB November 2024

MyLife is a social media platform with 93.6 million users, all aged 13 years old and above. The following frequency table shows the number of users by age group.

Age, a (years)	**Millions of users**
$13 \leq a < 18$	5.5
$18 \leq a < 25$	23.6
$25 \leq a < 45$	43.5
$45 \leq a < 65$	17.3
$65 \leq a < 85$	3.7
Total	**93.6**

(a) **Find** the percentage of *MyLife* users aged 45 years or older. **[1]**

Questions © International Baccalaureate Organization (diagrams redrawn). For use by students of this class only. Do not share.