

# Combined & Conditional Probability

## Question Paper

Course	Edexcel IGCSE Maths
Section	6. Statistics & Probability
Topic	Combined & Conditional Probability
Difficulty	Medium

**Time allowed:** 80  
**Score:** /63  
**Percentage:** /100

**Question 1a**

When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	Mel	Tom
point down	31	53	16
point up	14	27	9

Rachael is going to drop the drawing pin once.

Whose results will give the best estimate for the probability that the drawing pin will land point up?

Give a reason for your answer.

[1 mark]

**Question 1b**

Stuart is going to drop the drawing pin twice.

Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

[2 marks]

**Question 2**

The probability that Sanay is late for school tomorrow is 0.05

The probability that Jaden is late for school tomorrow is 0.15

Alfie says that the probability that Sanay and Jaden will both be late for school tomorrow is 0.0075 because  $0.05 \times 0.15 = 0.0075$

What assumption has Alfie made?

[1 mark]

### Question 3

Shabeen has a biased coin.

The probability that the coin will land on heads is 0.6

Shabeen is going to throw the coin 3 times.

She says the probability that the coin will land on tails 3 times is less than 0.1

Is Shabeen correct?

You must show all your working.

[3 marks]

### Question 4a

Here are seven tiles.



Jim takes at random a tile.

He does **not** replace the tile.

Jim then takes at random a second tile.

Calculate the probability that both the tiles Jim takes have the number 1 on them.

[2 marks]

### Question 4b

Calculate the probability that the number on the second tile Jim takes is greater than the number on the first tile he takes.

[3 marks]

### **Question 5**

There are 9 counters in a bag.

7 of the counters are green.

2 of the counters are blue.

Ria takes at random two counters from the bag.

Work out the probability that Ria takes one counter of each colour.

You must show your working.

[4 marks]

### **Question 6**

Fiza has 10 coins in a bag.

There are three £1 coins and seven 50 pence coins.

Fiza takes at random, 3 coins from the bag.

Work out the probability that she takes exactly £2.50

[4 marks]

**Question 7a**

There are 7 blue counters, 3 green counters and 1 red counter in a bag.  
There are no other counters in the bag.

Hubert takes at random 2 counters from the bag.

Work out the probability that both counters are blue.

**[3 marks]**

**Question 7b**

Work out the probability that the 2 counters are different colours.

**[3 marks]**

### Question 8

A box contains 15 counters.

There are 4 red counters, 5 green counters and the rest are yellow counters.

Niklas takes at random a counter from the box and writes down the colour of his counter.

He then puts the counter back into the box.

Sasha then takes at random a counter from the box and writes down the colour of her counter.

Work out the probability that the counters taken by Niklas and Sasha both have the same colour.

**[3 marks]**

### Question 9a

Barney has a biased coin.

When the coin is thrown once, the probability that the coin will land heads is 0.3

Barney throws the coin 4 times.

Work out the probability that the coin will land heads exactly 3 times.

**[3 marks]**

### Question 9b

Work out the probability that the coin will land heads at least once.

**[2 marks]**

### **Question 10**

Steffi is going to play one game of tennis and one game of chess.

The probability that she will win the game of tennis is 0.6

The probability that she will win **both** games is 0.42

Work out the probability that she will **not** win either game.

**[4 marks]**

### **Question 11**

Sophie takes an examination.

If she fails the examination, she will resit.

The probability that Sophie passes the examination on her first attempt is 0.7

If she fails the examination on any attempt, the probability she passes on the next attempt is 0.9

Work out the probability that Sophie takes at most 2 attempts to pass the examination.

**[3 marks]**

### Question 12a

20 people were asked which device they used more often, laptop or phone.

The table shows the results.

	Laptop	Phone
Male	2	9
Female	4	5

One male and one female are chosen at random.

Work out the probability that **exactly** one of them said laptop.

[3 marks]

### Question 12b

Two males are chosen at random.

Work out the probability that they **both** said phone.

[2 marks]



### **Question 13**

A bag contains 20 discs.

10 are red, 7 are blue and 3 are green.

Marnie takes a disc at random before putting it back in the bag.

Nick then takes a disc at random before putting it back in the bag.

Ollly then takes a disc at random.

Work out the probability that they all take a red disc.

**[2 marks]**

### **Question 14**

A bus company has a large number of buses.

25% of the buses are more than 10 years old.

If a bus is more than 10 years old, the probability that it will start first time is 0.3.

If a bus is less than 10 years old, the probability that it will start first time is 0.65.

Amir is asked to drive one of the company's buses, chosen at random.

Calculate the probability that the bus starts first time.

**[4 marks]**

**Question 15**

Dani has a pack of 45 cards.  
Each card is either red or black.

One-third of the cards in the pack are **red**.

She picks two cards from the pack, without replacement.

Calculate the probability that Dani picks two **black** cards.

[5 marks]

**Question 16a**

Antonio rolls two fair six-sided dice and calculates the **difference** between the scores.  
For example, if the two scores are 2 and 5 or 5 and 2 then the difference is 3.

Complete the sample space diagram to show the possible outcomes from Antonio's dice.

		Dice 2					
		difference	1	2	3	4	5
Dice 1	1	0					
	2					3	
	3			1			
	4						
	5			3			
	6						

[2 marks]

**Question 16b**

Antonio rolls the two dice three times.

Calculate the probability that he gets a difference of 1 on all three rolls.

Give your answer as a fraction in its lowest terms.

**[4 marks]**