



Maths
Leaving Certificate
Ordinary Level

Past Exam Questions
Marking Scheme on
Probability

Q1 2013 Paper 2 section A

Question 1

(25 marks)

Katie tossed a coin 200 times and threw 109 heads. Joe tossed the same coin 400 times and threw 238 heads. Lucy tossed the same coin 500 times and threw 291 heads. Katie, Joe and Lucy now think the coin may be biased.

- (a) Give a reason why they think that the coin may be biased.

Each player tosses more than 50% heads.

- (b) Lucy uses all the above data and calculates that the best estimate of the probability of throwing a head with this coin is 0.58. Show how Lucy might have calculated this probability.

Number of heads tossed: $109 + 238 + 291 = 638$
Total numbers of tosses: $200 + 400 + 500 = 1100$
$$P(\text{head}) = \frac{638}{1100} = 0.58$$

- (c) Joe agrees with Lucy's estimate of 0.58 as the probability of throwing a head with this coin. He claims that the probability of throwing 3 successive heads with this coin is less than the probability of throwing 2 successive tails. Calculate the probability of each event and state whether Joe's claim is true or not.

$P(3 \text{ heads}) = 0.58^3 \approx 0.195$
 $P(2 \text{ tails}) = 0.42^2 \approx 0.176$
Joe's claim is not true.

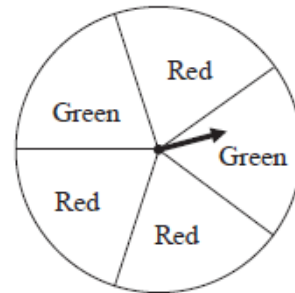
Q2 2013 Paper 2 Section A

Question 2

(25 marks)

An unbiased circular spinner has a movable pointer and five equal sectors, two coloured green and three coloured red.

- (a) (i) Find the probability that the pointer stops on green for one spin of the spinner.



$$P(\text{Green}) = \frac{2}{5}$$

- (ii) List all the possible outcomes of three successive spins of the spinner.

RRR

RRG

RGR

GRR

RGG

GRG

GGR

GGG

- (b) A game consists of spinning the spinner 3 times. Each time the spinner stops on green the player wins €1, otherwise the player wins nothing. For example, if the outcome of one game is “green, red, green” the player wins €2.

Complete the following table:

Player wins	€0	€1	€2	€3
Required outcomes	RRR	RRG RGR GRR	RGG GRG GGR	GGG

- (c) Is one spin of the spinner above an example of a Bernoulli trial?

Answer: Yes

Explain what a Bernoulli trial is.

A Bernoulli trial is an experiment whose outcome is random and can be either of two possibilities: “success” or “failure”.

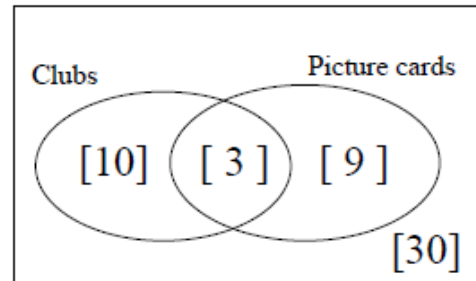
Q2 2012 Paper 2 Section A

Question 2

(25 marks)

- (a) In the Venn diagram below, the universal set is a normal deck of 52 playing cards. The two sets shown represent *clubs* and *picture cards* (kings, queens and jacks).

Show on the diagram the number of elements in each region.



- (b) (i) A card is drawn from a pack of 52 cards.
Find the probability that the card drawn is the king of clubs.

$$P(\text{king of clubs}) = \frac{1}{52}$$

- (ii) A card is drawn from a pack of 52 cards.
Find the probability that the card drawn is a club or a picture card.

$$P(\text{club or picture card}) = \frac{22}{52} = \frac{11}{26}$$

- (iii) Two cards are drawn from a pack of 52 cards. Find the probability that neither of them is a club or a picture card. Give your answer correct to two decimal places.

$$P(\text{not club or picture card}) = \frac{30}{52} \times \frac{29}{51} \approx 0.33$$