Probability: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Two fair coins are tossed.

(a) List all the possible outcomes.

(b) Find the probability of getting two heads.

(c) Find the probability of getting exactly one head.

Question 2

A spinner with three equal sections numbered 1, 2 and 3 is spun, and a fair coin is tossed.

(a) List all the possible outcomes, for example (1, H).

(b) Find the probability of getting an odd number and a head.

Question 3

Two fair six-sided dice are rolled.

(a) How many possible outcomes are there?

(b) Find the probability of rolling a double (both dice show the same number).

(c) Find the probability that the two numbers add to 7.

Question 4

A bag contains one red (R), one blue (B) and one green (G) counter. Two counters are taken out one after the other, without replacement.

(a) List all the possible outcomes, in order of selection.

(b) Find the probability that the red counter is one of the two counters taken.

Section B: Standard (Questions 5-10)

Question 5

Two fair four-sided dice, each numbered 1 to 4, are rolled and the two numbers are added.

(a) Draw a table (array) showing all the possible totals.

(b) Find the probability that the total is 5.

(c) Find the probability that the total is greater than 6.

(d) Which total is most likely?

Question 6

A bag contains 3 red and 2 green marbles. A marble is taken at random, its colour is noted and it is put back. A second marble is then taken.

(a) Draw a tree diagram showing the probability on each branch.

(b) Find the probability that both marbles are red.

(c) Find the probability of getting one marble of each colour.

(d) Find the probability of getting at least one green marble.

Question 7

The same bag of 3 red and 2 green marbles is used, but this time the first marble is not put back before the second marble is taken.

(a) Draw a tree diagram showing the probability on each branch.

(b) Find the probability that both marbles are red.

(c) Find the probability of getting one marble of each colour.

(d) Find the probability that both marbles are green.

Question 8

Two students are chosen at random from Ava, Ben, Chloe and Dev to form a committee. The order in which they are chosen does not matter. Ava and Chloe are girls; Ben and Dev are boys.

(a) List all the possible committees.

(b) Find the probability that Ava is on the committee.

(c) Find the probability that the committee has one girl and one boy.

Question 9

A captain and a vice-captain are chosen at random from Ava, Ben, Chloe and Dev. The same person cannot be both.

(a) List all the possible outcomes, writing the captain first.

(b) Find the probability that Ava is captain.

(c) Explain why there are twice as many outcomes here as there are when two of these students are chosen for a committee where order does not matter.

Question 10

Two fair six-sided dice are rolled and the two numbers are multiplied.

(a) Draw a table showing all 36 products.

(b) Find the probability that the product is even.

(c) Find the probability that the product is greater than 20.

(d) Find the probability that the product is a square number.

Probability: answers

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Question 1

Answer: (a) HH, HT, TH, TT (b) ¼ (c) 2/4 = ½

Question 2

Answer: (a) (1, H), (1, T), (2, H), (2, T), (3, H), (3, T) (b) 2/6 = ⅓

Question 3

Answer: (a) 36 (b) 6/36 = ⅙ (c) 6/36 = ⅙

Question 4

Answer: (a) RB, RG, BR, BG, GR, GB (b) 4/6 = ⅔

Question 5

Answer: (a) Totals: first die 1: 2, 3, 4, 5; first die 2: 3, 4, 5, 6; first die 3: 4, 5, 6, 7; first die 4: 5, 6, 7, 8 (b) 4/16 = ¼ (c) 3/16 (d) 5

Question 6

Answer: (a) Each stage: R ⅗, G ⅖ (b) 9/25 (c) 12/25 (6/25 + 6/25) (d) 16/25 (1 - 9/25)

Question 7

Answer: (a) First: R ⅗, G ⅖. After R: R 2/4, G 2/4. After G: R ¾, G ¼ (b) 6/20 = 3/10 (c) 12/20 = ⅗ (d) 2/20 = 1/10

Question 8

Answer: (a) Ava and Ben, Ava and Chloe, Ava and Dev, Ben and Chloe, Ben and Dev, Chloe and Dev (b) 3/6 = ½ (c) 4/6 = ⅔

Question 9

Answer: (a) 12 outcomes: (Ava, Ben), (Ava, Chloe), (Ava, Dev), (Ben, Ava), (Ben, Chloe), (Ben, Dev), (Chloe, Ava), (Chloe, Ben), (Chloe, Dev), (Dev, Ava), (Dev, Ben), (Dev, Chloe) (b) 3/12 = ¼ (c) Order matters here: each pair of students, such as Ava and Ben, gives two outcomes (Ava captain or Ben captain), so 6 pairs give 12 outcomes.

Question 10

Answer: (a) Rows of products: 1, 2, 3, 4, 5, 6; 2, 4, 6, 8, 10, 12; 3, 6, 9, 12, 15, 18; 4, 8, 12, 16, 20, 24; 5, 10, 15, 20, 25, 30; 6, 12, 18, 24, 30, 36 (b) 27/36 = ¾ (c) 6/36 = ⅙ (products 24, 24, 25, 30, 30, 36) (d) 8/36 = 2/9