



S18-test Probability Basics and the Probability Scale: Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Five words are used in statistics to describe how likely an event is to happen: impossible, unlikely, evens, likely, certain.

Match each description below to the correct probability word.

- (a) An event that can never happen. (1)
- (b) An event that is just as likely to happen as it is not to happen. (1)
- (c) An event that will definitely happen. (1)
- (d) An event that probably will not happen, although it is possible. (1)
- (e) An event that probably will happen, although it is not certain. (1)

(Total for Question 1 is 5 marks)

2 An ordinary fair six-sided dice has faces numbered 1 to 6.

(a) Write down the probability of rolling a 7. (1)

.....

(b) Write down the probability of rolling a number less than 7. (1)

.....

(c) A bag contains only blue counters. State, using one of the words impossible, unlikely, evens, likely or certain, the likelihood of picking a red counter from the bag. (1)

(Total for Question 2 is 3 marks)

3 Probabilities can be written as fractions, decimals or percentages.

(a) A probability is given as $\frac{1}{4}$. Write this probability as (i) a decimal and (ii) a percentage. (2)

(b) A probability is given as 0.6. Write this probability as (i) a fraction in its simplest form and (ii) a percentage. (2)

(c) A probability is given as 45%. Write this probability as (i) a decimal and (ii) a fraction in its simplest form. (2)

(Total for Question 3 is 6 marks)

- 4** A bag contains 40 sweets. 14 are strawberry, 11 are lime, and the rest are orange. A sweet is picked at random. Work out the probability that it is orange.

(Total for Question 4 is 3 marks)

- 5** A student wants to test whether a six-sided dice is fair, by rolling it many times and recording her results.

- (a)** State the stage of the statistical enquiry cycle at which the student decides how many times to roll the dice. **(1)**
- (b)** State the stage of the statistical enquiry cycle at which the student records the result of each roll. **(1)**
- (c)** The student rolls the dice 300 times and a six occurs 74 times. State the stage of the statistical enquiry cycle at which she would calculate the relative frequency of rolling a six, and calculate this relative frequency, giving your answer to 3 significant figures. **(3)**
- (d)** The theoretical probability of rolling a six on a fair dice is $\frac{1}{6}$ (which is about 0.167 to 3 s.f.). Using this and your answer to part (c), state the stage of the statistical enquiry cycle at which the student would draw a conclusion, and comment on whether her results suggest the dice may be biased. **(2)**

(Total for Question 5 is 7 marks)

- 6** A weather forecaster says there is a 20% chance of snow on a particular day. Sanjay says: "This means there is definitely no snow that day, since 20% is a small number." Evaluate Sanjay's statement, explaining what a 20% probability actually means, and state the probability word that best describes how likely snow is.

(Total for Question 6 is 3 marks)

Mark scheme · S18-test Probability Basics and the Probability Scale: Test Pack

Question 1

- (a) **B1** impossible cao
- (a) **Answer: Impossible**
- (b) **B1** evens cao
- (b) **Answer: Evens**
- (c) **B1** certain cao
- (c) **Answer: Certain**
- (d) **B1** unlikely cao
- (d) **Answer: Unlikely**
- (e) **B1** likely cao
- (e) **Answer: Likely**

Question 2

- (a) **B1** 0 cao
- (a) **Answer: 0**
- (b) **B1** 1 cao
- (b) **Answer: 1**
- (c) **B1** impossible cao
- (c) **Answer: Impossible**

Question 3

- (a) **B1** 0.25 cao
- (a) **B1** 25% cao
- (a) **Answer: 0.25 and 25 %**
- (b) **B1** $\frac{3}{5}$ cao
- (b) **B1** 60% cao
- (b) **Answer: $\frac{3}{5}$ and 60 %**
- (c) **B1** 0.45 cao
- (c) **B1** $\frac{9}{20}$ cao
- (c) **Answer: 0.45 and $\frac{9}{20}$**

Question 4

- **M1** $40 - 14 - 11 (= 15)$, oe
- **M1** $\frac{15}{40}$, oe
- **A1** $\frac{3}{8}$ cao
- **Answer: $\frac{3}{8}$**

Question 5

- (a) **B1** Plan cao
- **(a) Answer: Plan**
- (b) **B1** Collect cao
- **(b) Answer: Collect**
- (c) **B1** Process cao
- (c) **M1** $74 \div 300$, oe
- (c) **A1** 0.247 (3 s.f.) cao, awrt 0.247
- **(c) Answer: Process; relative frequency = 0.247 (3 s.f.)**
- (d) **B1** Interpret cao
- (d) **B1** valid comment comparing 0.247 with 0.167, e.g. the relative frequency is noticeably higher than the theoretical probability, which could suggest the dice is biased towards six, although more rolls would give a more reliable conclusion, oe
- **(d) Answer: Interpret; the relative frequency (0.247) is higher than the theoretical probability (0.167), which suggests the dice could be biased towards six, though further rolls would confirm this.**

Question 6

- **B1** identifies that Sanjay's statement is incorrect
- **B1** a correct explanation, e.g. a probability of 20% is not zero; over many similar days, snow would occur on about 20% of them, oe
- **B1** unlikely cao
- **Answer: Sanjay is wrong. A 20% probability is a real, nonzero chance, meaning snow would occur on about 20% of many similar days; it does not rule snow out. The likelihood is best described as unlikely.**