GCSE Foundation Mathematics
Practice Test 1: Statistics

Instructions:
Answer all questions. Show your working clearly.
Calculators may be used unless stated otherwise.
Time allowed: 90 minutes

Section A: Averages and Range

1. Find the mean, median, mode, and range for these data sets:

   (a) $5, 7, 3, 8, 5, 9, 6, 5$

   (b) $12, 15, 18, 12, 20, 16, 12, 14$

   (c) $2.1, 3.5, 2.8, 4.2, 3.5, 2.9, 3.5$

   (d) $45, 52, 48, 45, 50, 47, 49, 45, 51$

2. The heights (in cm) of 10 students are:

$$158, 162, 155, 160, 163, 159, 161, 157, 164, 156$$

   Calculate:

   (a) The mean height

   (b) The median height

   (c) The range

3. The test scores of a class are:

$$65, 72, 68, 75, 70, 73, 69, 71, 74, 67, 76, 68$$

   Find:

   (a) The mean score

   (b) The median score

   (c) How many students scored above the mean

4. A set of 5 numbers has a mean of 12. Four of the numbers are 8, 10, 14, and 16. Find the fifth number.

5. The mean of 6 numbers is 15. When a seventh number is added, the mean becomes 16. Find the seventh number.

6. In a data set, the mean is 25, the median is 23, and the range is 18. If the smallest value is 12, find the largest value.

Section B: Frequency Tables

7. The frequency table shows the number of pets owned by students:

Number of pets	Frequency
0	8
1	12
2	15
3	6
4	3
5	1

Calculate:

   (a) The total number of students

   (b) The mode

   (c) The median

   (d) The mean number of pets

   (e) The range

8. The frequency table shows the ages of people at a concert:

Age group	Frequency
10-19	25
20-29	45
30-39	35
40-49	20
50-59	10

Find:

   (a) The total number of people

   (b) The modal age group

   (c) An estimate of the mean age (use midpoints)

   (d) The percentage of people aged under 30

9. Complete this frequency table for the data:

$$3, 5, 2, 7, 5, 3, 8, 5, 6, 3, 7, 5, 4, 6, 5$$

Value	Frequency
2	
3	
4	
5	
6	
7	
8	

Then find the mode and median.

Section C: Charts and Graphs

10. The bar chart shows the favourite subjects of Year 10 students.

    [Imagine a bar chart with: Maths-20, English-15, Science-25, History-10, Art-12]

    (a) How many students chose Science?

    (b) Which subject is the most popular?

    (c) How many students were surveyed in total?

    (d) What percentage chose Maths?

    (e) Draw a pie chart for this data (calculate the angles)

11. The pie chart shows how 120 students travel to school.

    [Imagine a pie chart with: Walk-90°, Bus-150°, Car-80°, Bike-40°]

    Calculate:

    (a) How many students walk to school

    (b) How many students travel by bus

    (c) How many students travel by car

    (d) How many students cycle to school

    (e) The percentage who walk

12. The histogram shows the time (in minutes) students spent on homework.

    [Imagine a histogram with time intervals: 0-10 (frequency 5), 10-20 (frequency 12), 20-30 (frequency 18), 30-40 (frequency 8), 40-50 (frequency 2)]

    Find:

    (a) The total number of students

    (b) The modal time interval

    (c) An estimate of the mean time

    (d) How many students spent more than 30 minutes

13. Draw a stem-and-leaf diagram for this data:

    $$23, 31, 28, 35, 42, 29, 33, 27, 38, 31, 26, 34, 30, 37, 25$$

    From your diagram, find:

    (a) The median

    (b) The range

    (c) The mode (if any)

Section D: Scatter Graphs and Correlation

14. Describe the type of correlation shown in these scatter graphs:

    (a) Height vs. Shoe size

    (b) Temperature vs. Ice cream sales

    (c) Price of car vs. Age of car

    (d) Rainfall vs. Umbrella sales

    (e) Student number vs. Test score

15. The table shows the hours of TV watched per week and test scores for 8 students:

TV hours	5	8	12	15	18	22	25	30
Test score	85	80	75	70	65	60	55	45

(a) Plot this data on a scatter graph

(b) Describe the correlation

(c) Draw a line of best fit

(d) Use your line to estimate the test score for someone who watches 20 hours of TV

(e) Use your line to estimate how many hours of TV someone watches if they score 90

16. State whether you would expect positive, negative, or no correlation between:

(a) Age of a person and their reaction time

(b) Amount of revision and exam score

(c) Shoe size and intelligence

(d) Outside temperature and heating bills

Section E: Basic Probability

17. Express these probabilities as fractions, decimals, and percentages:

(a) Certain to happen

(b) Impossible

(c) Even chance

(d) Very likely

(e) Very unlikely

18. A fair six-sided die is rolled. Find the probability of getting:

(a) A 6

(b) An even number

(c) A number greater than 4

(d) A number less than 3

(e) A 7

(f) A number from 1 to 6

19. A bag contains 5 red balls, 3 blue balls, and 2 green balls. A ball is picked at random. Find the probability of picking:

(a) A red ball

(b) A blue ball

(c) A green ball

(d) A red or blue ball

(e) Not a green ball

20. A spinner has 8 equal sections: 3 red, 3 blue, and 2 yellow. Find the probability of spinning:

(a) Red

(b) Blue

    (c) Yellow

    (d) Red or yellow

    (e) Not blue

21. The probability of rain tomorrow is $\frac{3}{5}$. What is the probability that it will not rain?

22. In a class of 30 students, 18 are girls. If a student is chosen at random, what is the probability they are:

    (a) A girl

    (b) A boy

Section F: Two-Way Tables and Combined Events

23. The two-way table shows information about students' favourite sports:

	Football	Tennis	Swimming	Total
Boys	25	8	12	45
Girls	15	18	22	55
Total	40	26	34	100

    If a student is chosen at random, find the probability they:

    (a) Like football

    (b) Are a girl who likes tennis

    (c) Are a boy

    (d) Like swimming, given they are a girl

    (e) Are a boy, given they like football

24. A card is drawn from a standard pack of 52 cards. Find the probability of drawing:

    (a) An ace

    (b) A heart

    (c) A red card

    (d) The ace of spades

    (e) A picture card (Jack, Queen, King)

    (f) A black ace

25. Two fair coins are tossed. List all possible outcomes and find the probability of getting:

    (a) Two heads

    (b) At least one tail

    (c) Exactly one head

    (d) Two tails

26. A bag contains 4 red counters and 6 blue counters. Two counters are drawn without replacement. Find the probability of drawing:

    (a) Two red counters

    (b) Two blue counters

    (c) One red and one blue counter

    (d) At least one red counter

Section G: Experimental Probability

27. A biased coin is flipped 100 times. It lands on heads 60 times.

    (a) What is the experimental probability of getting heads?
    (b) What is the experimental probability of getting tails?
    (c) If the coin is flipped 250 more times, estimate how many heads you would expect

28. A spinner is tested 200 times with these results: Red: 45 times, Blue: 75 times, Green: 50 times, Yellow: 30 times

    Calculate:

    (a) The experimental probability of each colour
    (b) Which colour is most likely to come up next
    (c) If the spinner is used 400 times, estimate how many times it will land on blue

29. The table shows the results of rolling a biased die 150 times:

Number	1	2	3	4	5	6
Frequency	20	25	30	35	25	15

    (a) Calculate the experimental probability of rolling each number
    (b) Which number is most likely to be rolled?
    (c) If the die is rolled 300 times, estimate how many times you would expect to get a 4
    (d) Compare these results with a fair die - which numbers appear more/less often than expected?

Section H: Problem Solving

30. A school survey asked 150 students about their favourite lunch. The results were: Pizza: 45 students, Pasta: 38 students, Salad: 32 students, Sandwich: 35 students

    (a) Draw a bar chart for this data
    (b) Calculate the angles needed for a pie chart
    (c) What percentage chose pizza?
    (d) If 600 students were in the school, estimate how many would choose pasta

31. The box plot shows the distribution of test scores:

    [Imagine a box plot with: Minimum 20, Q1 35, Median 50, Q3 65, Maximum 85]

    From the box plot, find:

    (a) The median score
    (b) The interquartile range
    (c) The range
    (d) What percentage of students scored above 65?
    (e) What percentage of students scored between 35 and 65?

32. A bag contains red, blue, and green marbles. The probability of drawing a red marble is $\frac{2}{5}$ and the probability of drawing a blue marble is $\frac{1}{4}$.

    (a) What is the probability of drawing a green marble?

    (b) If there are 20 marbles in total, how many of each colour are there?

33. The mean mark of 20 girls in a test is 75. The mean mark of 15 boys is 68. Calculate the mean mark for the whole class.

34. A factory produces 1000 light bulbs. 25 are found to be faulty.

    (a) What is the probability that a randomly chosen bulb is faulty?

    (b) In a batch of 5000 bulbs, estimate how many would be faulty

    (c) What is the probability that a randomly chosen bulb is not faulty?

35. Compare these two data sets: Set A: 10, 12, 15, 18, 20, 22, 25 Set B: 8, 14, 16, 17, 19, 21, 27

Calculate the mean and range for each set, and comment on which set is more consistent.

Answer Space

Use this space for your working and answers.

END OF TEST

Total marks: 100

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