GCSE Foundation Mathematics
Practice Test 4: 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) $12, 7, 15, 12, 9, 12, 13, 8$

   (b) $35, 28, 32, 35, 41, 30, 35, 38$

   (c) $4.6, 2.3, 3.8, 2.3, 5.1, 2.3, 4.2$

   (d) $74, 82, 67, 74, 89, 76, 71, 74, 85$

2. The scores (out of 100) of 10 contestants in a quiz are:

   $$84, 76, 91, 78, 86, 82, 89, 75, 88, 81$$

   Calculate:

   (a) The mean score

   (b) The median score

   (c) The range

3. The weekly hours worked by employees are:

   $$42, 38, 45, 41, 36, 44, 39, 43, 37, 46, 40, 35$$

   Find:

   (a) The mean hours worked

   (b) The median hours worked

   (c) How many employees worked more than the mean

4. A set of 9 numbers has a mean of 34. Eight of the numbers are 28, 31, 36, 42, 29, 38, 35, and 33. Find the ninth number.

5. The mean of 14 numbers is 48. When a fifteenth number is added, the mean becomes 50. Find the fifteenth number.

6. In a data set, the mean is 58, the median is 53, and the range is 36. If the largest value is 78, find the smallest value.

Section B: Frequency Tables

7. The frequency table shows the number of emails received by office workers in a day:

Number of emails	Frequency
10	7
11	18
12	25
13	14
14	9
15	2

Calculate:

(a) The total number of workers

(b) The mode

(c) The median

(d) The mean number of emails

(e) The range

8. The frequency table shows the speeds of cars (in mph):

Speed group	Frequency
20-29	15
30-39	42
40-49	38
50-59	26
60-69	9

Find:

(a) The total number of cars

(b) The modal speed group

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

(d) The percentage of cars traveling faster than 49 mph

9. Complete this frequency table for the data:

$$8, 6, 10, 8, 5, 6, 11, 8, 7, 6, 10, 8, 9, 7, 8$$

Value	Frequency
5	
6	
7	
8	
9	
10	
11	

Then find the mode and median.

Section C: Charts and Graphs

10. The bar chart shows the types of transport used by commuters.

    [Imagine a bar chart with: Car-45, Train-32, Bus-28, Bike-15, Walk-20]

    (a) How many commuters use the train?
    (b) Which transport method is most popular?
    (c) How many commuters were surveyed in total?
    (d) What percentage use a bike?
    (e) Draw a pie chart for this data (calculate the angles)

11. The pie chart shows how 240 students spend their lunch break.

    [Imagine a pie chart with: Eating-108°, Studying-72°, Sports-90°, Socializing-60°, Library-30°]

    Calculate:

    (a) How many students spend time eating
    (b) How many students play sports
    (c) How many students go to the library
    (d) How many students study
    (e) The percentage who socialize

12. The histogram shows the distances (in km) people travel to work.

    [Imagine a histogram with distance intervals: 0-10 (frequency 14), 10-20 (frequency 22), 20-30 (frequency 18), 30-40 (frequency 11), 40-50 (frequency 5)]

    Find:

    (a) The total number of people surveyed
    (b) The modal distance interval
    (c) An estimate of the mean distance
    (d) How many people travel more than 30km to work

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

    $$54, 68, 51, 72, 59, 66, 48, 73, 62, 57, 69, 64, 55, 71, 63$$

    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) Hours of training vs. Athletic performance
    (b) Age of computer vs. Processing speed
    (c) Postcode vs. Height
    (d) Humidity vs. Hair frizziness
    (e) Ticket number vs. Prize value

15. The table shows the study hours per week and final exam percentage for 8 students:

Study hours	8	12	16	20	24	28	32	36
Exam %	55	62	69	76	83	90	97	104

    (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 exam percentage for 22 hours of study
    (e) Use your line to estimate study hours needed for 85% exam score

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

    (a) Amount of fertilizer and plant growth
    (b) Distance from city center and house price
    (c) Social security number and salary
    (d) Years of education and income level

Section E: Basic Probability

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

    (a) Guaranteed to happen
    (b) Cannot possibly occur
    (c) Equal likelihood
    (d) Very probable
    (e) Extremely unlikely

18. A fair ten-sided die (numbered 1-10) is rolled. Find the probability of getting:

    (a) A 4
    (b) A factor of 10
    (c) A number greater than 7
    (d) A number less than 6
    (e) An 11
    (f) An even number

19. A container holds 11 white balls, 6 black balls, and 7 grey balls. A ball is picked at random. Find the probability of picking:

    (a) A white ball
    (b) A black ball
    (c) A grey ball
    (d) A white or black ball
    (e) Not a grey ball

20. A game spinner has 15 equal sections: 6 blue, 5 green, and 4 yellow. Find the probability of spinning:

    (a) Blue
    (b) Green

(c) Yellow

(d) Blue or yellow

(e) Not green

21. The probability of a team winning their next match is $\frac{7}{10}$. What is the probability they will not win?

22. In a book club of 60 members, 36 prefer fiction books. If a member is chosen at random, what is the probability they:

(a) Prefer fiction

(b) Prefer non-fiction

Section F: Two-Way Tables and Combined Events

23. The two-way table shows information about customers' drink preferences:

	Coffee	Tea	Juice	Total
Adults	48	32	20	100
Children	12	18	45	75
Total	60	50	65	175

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

(a) Prefer coffee

(b) Are a child who prefers juice

(c) Are an adult

(d) Prefer tea, given they are a child

(e) Are an adult, given they prefer coffee

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

(a) A jack

(b) A spade

(c) A black card

(d) The king of clubs

(e) An ace or king

(f) A red jack

25. A fair die is rolled twice. List the total possible outcomes and find the probability of getting:

(a) A total of 8

(b) Both numbers the same

(c) A total greater than 10

(d) The first roll greater than the second

26. A bag contains 10 green tokens and 6 yellow tokens. Two tokens are drawn without replacement. Find the probability of drawing:

(a) Two green tokens

(b) Two yellow tokens

(c) One green and one yellow token

(d) At least one green token

Section G: Experimental Probability

27. A biased coin is flipped 150 times. It lands on tails 54 times.

    (a) What is the experimental probability of getting tails?

    (b) What is the experimental probability of getting heads?

    (c) If the coin is flipped 400 more times, estimate how many tails you would expect

28. A gaming machine is tested 240 times with these results: Win: 72 times, Small prize: 96 times, No prize: 72 times

    Calculate:

    (a) The experimental probability of each outcome

    (b) Which outcome is most likely to occur next

    (c) If the machine is used 480 times, estimate how many wins you would expect

29. The table shows the results of drawing balls from a bag 160 times:

Colour	Red	Blue	Green	Yellow
Frequency	52	48	36	24

    (a) Calculate the experimental probability of each colour

    (b) Which colour appeared most frequently?

    (c) If balls are drawn 320 times, estimate how many blue balls you would expect

    (d) If the bag contained equal numbers of each colour, what frequency would you expect for each in 160 draws?

Section H: Problem Solving

30. A restaurant survey asked 300 diners about their preferred cuisine. The results were: Italian: 85 diners, Chinese: 72 diners, Indian: 58 diners, Mexican: 48 diners, Thai: 37 diners

    (a) Draw a bar chart for this data

    (b) Calculate the angles needed for a pie chart

    (c) What percentage chose Italian?

    (d) If 1200 people dined at the restaurant, estimate how many would choose Chinese

31. The box plot shows the distribution of house prices (£1000s):

    [Imagine a box plot with: Minimum 120, Q1 180, Median 220, Q3 280, Maximum 350]

    From the box plot, find:

    (a) The median house price

    (b) The interquartile range

    (c) The range

    (d) What percentage of houses cost more than £280,000?

    (e) What percentage of houses cost between £180,000 and £280,000?

32. A lottery has red, blue, and green balls. The probability of drawing red is $\frac{2}{5}$ and the probability of drawing blue is $\frac{3}{10}$.

    (a) What is the probability of drawing green?

(b) If there are 40 balls in total, how many of each colour are there?

33. The mean weight of 25 dogs is 28kg. The mean weight of 15 cats is 4.5kg. Calculate the mean weight for all 40 animals.

34. A production line makes 3000 components. 84 are found to be defective.

    (a) What is the probability that a randomly chosen component is defective?

    (b) In a batch of 12000 components, estimate how many would be defective

    (c) What is the probability that a randomly chosen component is not defective?

35. Compare these two data sets: Set M: 45, 48, 52, 55, 58, 61, 64 Set N: 38, 49, 53, 56, 57, 59, 68

    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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