MATHEMATICS MCQ BOOKLET

Grade 9 · Chapter 11 · Basic Statistics

FBISE / National Book Foundation Model Textbook companion

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Independent MCQs on grouped frequency tables, histograms (including unequal intervals), frequency polygons, mean, median, mode, weighted mean, and basic probability. Not copied from the book exercise. Total: 108 questions. Each item has four options, the correct letter, and a short explanation of why it is correct.

A. Important / Main Topics

1. Raw (ungrouped) data means values that have:

(A) not yet been arranged into a systematic grouped table
(B) already been placed in class intervals
(C) only class boundaries
(D) only cumulative frequencies

Correct Answer: A

Explanation: Ungrouped data is the original list; grouping organises it into classes with frequencies.

2. Grouped data is a table in which values are distributed into classes and each class shows its:

(A) class mark only
(B) frequency (how many items fall in that class)
(C) probability only
(D) mode only

Correct Answer: B

Explanation: Grouped data is a table in which values are distributed into classes and each class shows its frequency (how many items fall in that class).

3. The smaller number of a class such as 21–30 is the:

(A) upper class limit
(B) class mark
(C) lower class limit
(D) frequency density

Correct Answer: C

Explanation: Lower class limit is the left end of the written interval.

4. The larger number of a class such as 21–30 is the:

(A) lower class limit
(B) adjustment factor
(C) relative frequency of a complementary event
(D) upper class limit

Correct Answer: D

Explanation: Upper class limit is the right end of the written interval.

5. Class boundaries are used so that continuous values sitting between written limits:

(A) can be placed without gaps between adjacent classes
(B) are discarded
(C) become class marks automatically
(D) equal the mode

Correct Answer: A

Explanation: Class boundaries are used so that continuous values sitting between written limits can be placed without gaps between adjacent classes.

6. For classes 1–10 and 11–20 the usual adjustment factor is:

(A) 1

(B) 0.5
(C) 2
(D) 10

Correct Answer: B

Explanation: Half the gap between 10 and 11 is 0.5, subtracted from lower limits and added to upper limits.

7. Class boundaries of 11–20 with adjustment 0.5 are:

(A) 11–20
(B) 11.5–19.5
(C) 10.5–20.5
(D) 10–21

Correct Answer: C

Explanation: The class boundaries are 10.5–20.5 because 11 − 0.5 = 10.5 and 20 + 0.5 = 20.5.

8. The size h of consecutive classes 1–10, 11–20, 21–30 is:

(A) 1
(B) 11
(C) 20
(D) 10

Correct Answer: D

Explanation: h is the difference of consecutive lower limits: 11 − 1 = 10 (also 21 − 11 = 10).

9. The class mark (mid-value) of a class is:

(A) the average of the lower and upper limits (or of the boundaries)
(B) the frequency
(C) the cumulative frequency
(D) always the lower boundary

Correct Answer: A

Explanation: x = (lower + upper)/2, and the same midpoint comes from the boundaries.

10. The class mark of 1–10 is:

(A) 1
(B) 5.5
(C) 10
(D) 4.5

Correct Answer: B

Explanation: The class mark is the midpoint of the limits: (1 + 10)/2 = 5.5.

11. The class mark of continuous class 0–10 is:

(A) 0
(B) 10
(C) 5
(D) 9.5

Correct Answer: C

Explanation: For a continuous class 0–10 the midpoint is (0 + 10)/2 = 5.

12. The difference between class marks of two consecutive equal-width classes equals:

(A) the total frequency n
(B) the mode
(C) the probability
(D) the class interval size h

Correct Answer: D

Explanation: Midpoints are spaced one class width apart.

13. Class boundaries can be recovered from a class mark x and width h as:

(A) x ± h/2

(B) x ± h
(C) x ± 2h
(D) x only

Correct Answer: A

Explanation: The class runs from x − h/2 to x + h/2.

14. Frequency of a grouped class is the:

(A) class mark
(B) number of observations falling in that class
(C) upper boundary
(D) adjustment factor

Correct Answer: B

Explanation: Frequency is a count, not a measurement of the class width.

15. Cumulative frequency of a class is the:

(A) class mark times h
(B) frequency density
(C) sum of that class's frequency and all frequencies before it
(D) relative frequency of a complementary event only

Correct Answer: C

Explanation: Each running total answers 'how many observations are in this class or earlier'.

16. The cumulative frequency of the last class equals:

(A) the first frequency
(B) the class mark
(C) zero always
(D) n, the total number of observations

Correct Answer: D

Explanation: By the last row you have counted everyone, so Σf = n.

17. A usual practical choice for the number of classes is about:

(A) 5 to 15, depending on the size of the data
(B) 1 or 2 only
(C) exactly 100 always
(D) n itself

Correct Answer: A

Explanation: A usual practical choice for the number of classes is about 5 to 15, depending on the size of the data.

18. An approximate class width from largest xl, smallest xs and planned number of classes k is:

(A) xl + xs
(B) (xl − xs)/k
(C) xl × k
(D) xs / k

Correct Answer: B

Explanation: An approximate class width from largest xl, smallest xs and planned number of classes k is (xl − xs)/k.

19. If xl = 86, xs = 26 and 6 classes are planned, h is about:

(A) 8
(B) 60
(C) 10
(D) 6

Correct Answer: C

Explanation: Range 60 divided by 6 is exactly 10.

20. In the tally-bar method, the fifth mark of a group of five is drawn:

(A) as a sixth vertical stroke

(B) as a class boundary
(C) as a class mark
(D) diagonally across four vertical strokes

Correct Answer: D

Explanation: In the tally-bar method, the fifth mark of a group of five is drawn diagonally across four vertical strokes.

21. After tallies are converted to frequencies you should check that Σf equals:

(A) the number of original ungrouped items
(B) the class mark total
(C) the adjustment factor
(D) h

Correct Answer: A

Explanation: A missing or double-counted value shows up as a wrong total.

22. Discrete data in this unit's sense (whole-number values that repeat) typically needs:

(A) wide class intervals and boundaries
(B) class size 1 and no class-boundary column
(C) frequency density on the y-axis always
(D) a histogram of unequal widths always

Correct Answer: B

Explanation: Each distinct value is its own class of width 1.

23. A histogram represents frequencies by:

(A) separated pictograms
(B) a single pie slice
(C) adjacent rectangles whose areas are proportional to class frequencies
(D) a scatter of unconnected points only

Correct Answer: C

Explanation: Bars touch because class boundaries meet; area, not mere height, carries the frequency.

24. On a histogram the bases of the rectangles are marked using:

(A) class marks only
(B) cumulative frequencies on the x-axis
(C) probabilities
(D) class boundaries on the horizontal axis

Correct Answer: D

Explanation: Boundaries give a continuous scale with no gaps between bars.

25. If all class widths are equal, bar heights of a histogram may be taken as:

(A) the class frequencies (or a constant times frequency)
(B) class marks
(C) boundaries
(D) modes

Correct Answer: A

Explanation: Equal width means height □ frequency because area = height × width.

26. If class widths are unequal, bar heights must be:

(A) the raw frequencies still
(B) frequency densities, frequency/width
(C) class marks
(D) cumulative frequencies

Correct Answer: B

Explanation: Area stays proportional to frequency only when height = frequency/width.

27. Frequency density is defined as:

(A) f × h

(B) Σf
(C) frequency divided by the width of the class
(D) the class mark

Correct Answer: C

Explanation: FD = f / h, which is the histogram height for unequal classes.

28. A class 0–20 has frequency 12. Its frequency density is:

(A) 12
(B) 20
(C) 240
(D) 0.6

Correct Answer: D

Explanation: Frequency density is frequency divided by width: 12/20 = 0.6.

29. A class 20–30 has frequency 18. Its frequency density is:

(A) 1.8
(B) 18
(C) 0.18
(D) 30

Correct Answer: A

Explanation: Frequency density is frequency divided by width: 18/10 = 1.8.

30. For unequal-interval histograms, the vertical axis should show:

(A) class marks
(B) frequency densities
(C) only n
(D) probabilities of complementary events

Correct Answer: B

Explanation: For unequal-interval histograms, the vertical axis should show frequency densities.

31. A frequency polygon is a closed figure formed by joining:

(A) upper class limits at height zero only
(B) only class boundaries at height f
(C) points (class mark, frequency) with straight segments, including extra zero-frequency classes at both ends
(D) tally marks

Correct Answer: C

Explanation: A frequency polygon is a closed figure formed by joining points (class mark, frequency) with straight segments, including extra zero-frequency classes at both ends.

32. You can also draw a frequency polygon on a histogram by joining:

(A) lower-left corners of bars
(B) the in-centre to the centroid
(C) cumulative-frequency points only
(D) midpoints of the top edges of the bars, then extending to the x-axis at the extra class marks

Correct Answer: D

Explanation: Those midpoints are exactly the (class mark, frequency) points.

33. If classes are 10–20, 20–30, 30–40, extra classes used to close the polygon are:

(A) 0–10 and 40–50 with frequency 0
(B) 20–30 twice
(C) 10–40 as one class
(D) the modal class twice

Correct Answer: A

Explanation: If classes are 10–20, 20–30, 30–40, extra classes used to close the polygon are 0–10 and 40–50 with frequency 0.

34. A measure of central tendency is a single value that:

(A) is always the range
(B) represents the whole data set as an average / location
(C) must be a class boundary
(D) is always a probability

Correct Answer: B

Explanation: Mean, median and mode are the three location averages in this unit.

35. The arithmetic mean of ungrouped values is:

(A) the middle of the unordered list
(B) the most frequent value
(C) Σx / n
(D) n / Σx

Correct Answer: C

Explanation: Mean is total divided by how many values there are.

36. The mean of 4, 8, 12, 16 is:

(A) 8
(B) 12
(C) 40
(D) 10

Correct Answer: D

Explanation: The four values add to 40, so the arithmetic mean is 40/4 = 10.

37. The mean of 7, 7, 7, 7 is:

(A) 7
(B) 0
(C) 28
(D) 4

Correct Answer: A

Explanation: A constant list has mean equal to that constant.

38. For a frequency table, the mean is:

(A) Σx / Σf without multiplying
(B) Σ(f x) / Σf
(C) the modal class mark always
(D) n × p

Correct Answer: B

Explanation: Each value x is counted f times, so the total is Σ f x.

39. If x = 2, 4, 6 with f = 3, 2, 5, then Σf x equals:

(A) 12
(B) 10
(C) 44
(D) 6

Correct Answer: C

Explanation: 2×3 + 4×2 + 6×5 = 6 + 8 + 30 = 44 and n = 10, so the mean would be 44/10 = 4.4.

40. For grouped data the x in Σ f x is taken as the:

(A) lower limit
(B) frequency density
(C) upper boundary only
(D) class mark of each class

Correct Answer: D

Explanation: The class is represented by its midpoint when computing a mean.

41. Classes 0–10, 10–20, 20–30 have frequencies 4, 6, 10. Class marks are 5, 15, 25, so the mean is:

(A) 18
(B) 20
(C) 360
(D) 15

Correct Answer: A

Explanation: $\Sigma f x = 4\times5 + 6\times15 + 10\times25 = 360$ and $n = 20$, so $360/20 = 18$.

42. If 12 values have mean 15, their sum is:

(A) 15
(B) 180
(C) 12
(D) 1.25

Correct Answer: B

Explanation: By definition of the mean, the sum of the values is n times the mean: $12 \times 15 = 180$.

43. Ten values have mean 22. Nine of them sum to 189. The tenth value is:

(A) 22
(B) 21
(C) 31
(D) 189

Correct Answer: C

Explanation: Total must be 220, so the missing value is $220 - 189 = 31$.

44. The median is the:

(A) most frequent value
(B) $\Sigma x / n$
(C) class width
(D) middle value after the data are arranged in order

Correct Answer: D

Explanation: Order first; then the central position is the median.

45. The symbol used in the unit for the median is:

(A) x-tilde ($\tilde{x}$)
(B) x-bar only
(C) σ
(D) p

Correct Answer: A

Explanation: The unit writes the mean as x-bar and the median as x-tilde, so they are not the same symbol.

46. For an odd number n of ordered values the median is the:

(A) n/2 th value
(B) (n + 1)/2 th value
(C) first value
(D) mean of all n values always

Correct Answer: B

Explanation: For an odd number n of ordered values the median is the (n + 1)/2 th value.

47. Ordered data 2, 5, 9, 11, 18 has median:

(A) 7
(B) 11
(C) 9
(D) 2

Correct Answer: C

Explanation: n = 5, (5 + 1)/2 = 3, and the 3rd value is 9.

48. For even n the median is the mean of the:

(A) first and last values
(B) two modes
(C) class marks only
(D) n/2 th and (n + 2)/2 th ordered values

Correct Answer: D

Explanation: Those two positions are the pair straddling the centre.

49. Ordered data 3, 6, 10, 14 has median:

(A) 8
(B) 6
(C) 10
(D) 4

Correct Answer: A

Explanation: The median is 8 because n = 4, so we average the 2nd and 3rd ordered values: (6 + 10)/2 = 8.

50. For grouped data the median is the n/2 th observation and the formula is:

(A) Σ f x / Σ f
(B) l + (h/f)(n/2 − c)
(C) l + ((fm − f1)/(2 fm − f1 − f2)) h
(D) n × p

Correct Answer: B

Explanation: l is the lower boundary of the median class, f its frequency, c the preceding cumulative frequency.

51. In the grouped-median formula, c must be taken from the:

(A) median class itself
(B) last class
(C) class immediately before the median class
(D) modal class always

Correct Answer: C

Explanation: In the grouped-median formula, c must be taken from the class immediately before the median class.

52. Frequencies 4, 6, 10, 5 on classes 0–10, 10–20, 20–30, 30–40 give n = 25 and n/2 = 12.5. The median class is:

(A) 0–10
(B) 30–40
(C) 10–20
(D) 20–30, because cf values 4, 10, 20, 25 first exceed 12.5 in 20–30

Correct Answer: D

Explanation: The median class is 20–30 because the cumulative frequencies 4, 10, 20, 25 first pass 12.5 there.

53. For that table, l = 20, h = 10, f = 10, c = 10, so the median is:

(A) 22.5
(B) 20
(C) 25
(D) 12.5

Correct Answer: A

Explanation: The median is 22.5 because 20 + (10/10)(12.5 − 10) = 20 + 2.5 = 22.5.

54. The mode is the:

(A) middle ordered value
(B) most frequent value (or values) of the data
(C) Σx / n

(D) class boundary

Correct Answer: B

Explanation: Modal average means 'typical by popularity', not by centre of the list.

55. Unlike mean and median, the mode of a data set:

(A) is always unique
(B) always equals the mean
(C) may be one value, several values, or absent if every value is equally frequent
(D) cannot be a whole number

Correct Answer: C

Explanation: Unimodal, bimodal, trimodal, or no mode are all possible.

56. In 4, 7, 7, 9, 7, 2 the mode is:

(A) 4
(B) 9
(C) there are two modes 4 and 2
(D) 7

Correct Answer: D

Explanation: 7 is the mode because it appears three times while every other value appears once.

57. The data 2, 2, 5, 5, 9 is:

(A) bimodal with modes 2 and 5
(B) unimodal with mode 9
(C) trimodal
(D) without a mode

Correct Answer: A

Explanation: The data are bimodal because 2 and 5 each appear twice, which is more than 9.

58. The data 1, 2, 3, 4 (each once) is treated as having:

(A) mode 1 only
(B) no mode, because every value has the same frequency
(C) mode 4
(D) four means

Correct Answer: B

Explanation: When all frequencies are equal there is no outstanding favourite.

59. The modal class of grouped data is the class with:

(A) smallest frequency
(B) largest class mark
(C) largest frequency
(D) frequency density 0

Correct Answer: C

Explanation: Mode is estimated inside the busiest class.

60. The grouped-data mode formula is:

(A) $l + (h/f)(n/2 - c)$
(B) $\Sigma f x / \Sigma f$
(C) $n \times p$
(D) $l + ((fm - f1)/(2\,fm - f1 - f2)) \times h$

Correct Answer: D

Explanation: fm is the modal frequency; f1 and f2 are the neighbouring frequencies.

61. If the first class is modal then f1 is taken as:

(A) 0
(B) fm
(C) f2

(D) n

Correct Answer: A

Explanation: There is no preceding class, so that neighbour frequency is zero.

62. Frequencies 3, 6, 12, 6, 3 on equal classes 0–10 through 40–50 have modal class 20–30. Then mode equals:

(A) 22
(B) 25
(C) 12
(D) 20

Correct Answer: B

Explanation: The mode is 25 because l = 20, fm = 12, f1 = f2 = 6, h = 10 gives 20 + 6/12 × 10 = 25.

63. An empirical link used when a distribution is moderately skewed is:

(A) mode = mean + median
(B) mean = 3 mode − 2 median
(C) mode = 3 median − 2 mean
(D) median = mean × mode

Correct Answer: C

Explanation: The Pearson-type relation mode ≈ 3 median − 2 mean, rearranged for any one of the three.

64. If mean = 16 and median = 15, the empirical mode is:

(A) 14
(B) 17
(C) 31
(D) 13

Correct Answer: D

Explanation: The empirical rule is mode = 3 median − 2 mean = 3×15 − 2×16 = 13.

65. If mode = 10 and mean = 16, the empirical median is:

(A) 14
(B) 12
(C) 26
(D) 6

Correct Answer: A

Explanation: The empirical median is 14 because (mode + 2 mean)/3 = (10 + 32)/3 = 14.

66. Weighted mean is used when the values are:

(A) all equally important, so weights are ignored
(B) not equally important, so each x is multiplied by a weight w
(C) class marks only
(D) probabilities only

Correct Answer: B

Explanation: Weighted mean is used when the values are not equally important, so each x is multiplied by a weight w.

67. For values 50, 70, 90 with weights 2, 3, 5 the weighted mean is:

(A) 70
(B) 90
(C) 76
(D) 10

Correct Answer: C

Explanation: Σ w x = 100 + 210 + 450 = 760 and Σ w = 10, so 760/10 = 76.

68. Probability of an event is a measure of chance and lies:

(A) always above 1

(B) only at 1/2
(C) in negative numbers for complements
(D) in the closed interval from 0 to 1

Correct Answer: D

Explanation: 0 is impossible, 1 is certain, and everyday events sit strictly between.

69. P(E) = (number of favourable outcomes) / (total number of equally likely outcomes). If a fair die is rolled, P(4) is:

(A) 1/6
(B) 1/4
(C) 4/6
(D) 1

Correct Answer: A

Explanation: P(4) is 1/6 because there is one favourable face out of six equally likely faces.

70. P(even number) on a fair die is:

(A) 1/6
(B) 1/2
(C) 2/3
(D) 0

Correct Answer: B

Explanation: The even faces are 2, 4 and 6, which is 3 out of 6 equally likely outcomes, so 1/2.

71. A single (simple) event consists of:

(A) the whole sample space
(B) two complementary outcomes always
(C) exactly one sample point
(D) an impossible pair

Correct Answer: C

Explanation: Each singleton subset of S is a simple event.

72. Two complementary events E and E′ satisfy:

(A) P(E) + P(E′) = 0
(B) P(E) = P(E′) always
(C) P(E′) = 2 P(E)
(D) P(E) + P(E′) = 1

Correct Answer: D

Explanation: E′ is ‘E does not occur’, so the two chances add to certainty.

73. If P(E) = 3/10 then P(E′) is:

(A) 7/10
(B) 3/7
(C) 10/3
(D) 0

Correct Answer: A

Explanation: Complementary probability is 1 minus P(E), so 1 − 3/10 = 7/10.

74. An event that cannot occur has probability:

(A) 1
(B) 0
(C) 1/2
(D) n

Correct Answer: B

Explanation: Zero favourable outcomes give P = 0; that is an impossible event.

75. An event that is certain to occur has probability:

(A) 0
(B) 1/2
(C) 1
(D) 2

Correct Answer: C

Explanation: Every outcome is favourable, so P = 1.

76. A probability cannot take the value:

(A) 0
(B) 1
(C) 1/2
(D) 1.4

Correct Answer: D

Explanation: 1.4 is greater than 1, which is outside the possible range.

77. Relative frequency (experimental probability) is:

(A) (times the event occurred) / (number of trials)
(B) n × p
(C) Σ f x / Σ f
(D) the class mark

Correct Answer: A

Explanation: It estimates P(E) from data; with many trials it tends to settle near the theoretical value.

78. A spinner is spun 40 times and lands on blue 12 times. Relative frequency of blue is:

(A) 12
(B) 12/40 = 0.3
(C) 40/12
(D) 1/2

Correct Answer: B

Explanation: Relative frequency is successes over trials: 12/40, which equals 0.3.

79. Expected frequency of an event is:

(A) always 0
(B) p / n
(C) n × p, trials times probability
(D) the mode

Correct Answer: C

Explanation: It is how often you predict the event in n independent trials.

80. A fair coin is tossed 80 times. Expected number of heads is:

(A) 80
(B) 20
(C) 1/2
(D) 40

Correct Answer: D

Explanation: Expected frequency is n times p, so 80 × 1/2 = 40 heads. A fair die rolled 240 times is likewise expected to show a six 240 × 1/6 = 40 times.

B. Less Important / Secondary Topics

81. Statistics is described in the unit as the science of collecting and:

(A) analysing numerical data
(B) erasing numerical facts
(C) drawing only triangles
(D) constructing altitudes

Correct Answer: A

Explanation: The subject organises data so that decisions can be based on counts and averages.

82. Online reviews or crowd size at different times of day are everyday uses of:

(A) SSA constructions
(B) data and chance thinking from statistics
(C) in-centres
(D) Euler lines

Correct Answer: B

Explanation: Online reviews or crowd size at different times of day are everyday uses of data and chance thinking from statistics.

83. A genetic 3 : 1 pattern (three matching outcomes out of four equally likely cells) has probability:

(A) 1/4 for the majority trait
(B) 1
(C) 3/4 for the majority trait
(D) 0

Correct Answer: C

Explanation: A genetic 3 : 1 pattern (three matching outcomes out of four equally likely cells) has probability 3/4 for the majority trait.

84. If that 3/4 probability applies to 200 independent offspring, the expected count of the majority trait is:

(A) 50
(B) 200
(C) 3
(D) 150

Correct Answer: D

Explanation: Expected frequency is n times p, so 200 × 3/4 = 150 offspring.

85. Tally sticks in the history note were early tools for:

(A) recording counts
(B) angle bisection
(C) drawing frequency polygons
(D) finding orthocentres

Correct Answer: A

Explanation: Tally sticks in the history note were early tools for recording counts.

86. A broken (kinked) scale at the start of a histogram axis is used when:

(A) n = 0
(B) the first boundary is far from zero and space should be saved
(C) classes are discrete of width 1 always
(D) probability is 1

Correct Answer: B

Explanation: The zigzag warns that the axis does not start at the origin.

87. In a histogram, area of a bar equals (on a density scale):

(A) the class mark
(B) h only
(C) frequency, because height × width = FD × h = f
(D) the median

Correct Answer: C

Explanation: That is why unequal-width bars must use frequency density.

88. 'Direct observation' frequency tables write the actual values in a class instead of:

(A) the total n

(B) class marks
(C) weights
(D) tally marks

Correct Answer: D

Explanation: Both methods must still add to the same frequencies.

89. If 34 of 50 scores are above 20, that reading comes from:

(A) adding frequencies of the classes above 20
(B) the mode formula
(C) P(E′)
(D) an altitude

Correct Answer: A

Explanation: If 34 of 50 scores are above 20, that reading comes from adding frequencies of the classes above 20.

90. The mean is pulled toward extreme values more than the median because it uses:

(A) only the middle pair
(B) every value in the sum
(C) only the modal class
(D) only class boundaries

Correct Answer: B

Explanation: The mean is pulled toward extreme values more than the median because it uses every value in the sum.

91. For a perfectly symmetric unimodal distribution, mean, median and mode are:

(A) as far apart as possible
(B) undefined
(C) equal (and the empirical relation holds as mode = mean)
(D) probabilities

Correct Answer: C

Explanation: 3m − 2m = m, so the formula is consistent with all three coinciding.

92. Weights in a weighted mean play the same algebraic role that frequencies play in:

(A) P(E′)
(B) SSA constructions
(C) class boundaries
(D) the ordinary frequency mean Σ f x / Σ f

Correct Answer: D

Explanation: Replace f by w; the formula is the same shape.

93. Sample space for one fair-coin toss is:

(A) {H, T}
(B) {1, 2, 3, 4, 5, 6}
(C) {0}
(D) {E, E′}

Correct Answer: A

Explanation: Sample space for one fair-coin toss is {H, T}.

94. P(sun rises in the east), treated as certain, is used in the unit as an example of probability:

(A) 0
(B) 1
(C) 1/2
(D) 2

Correct Answer: B

Explanation: P(sun rises in the east), treated as certain, is used in the unit as an example of probability 1.

95. If three names are equally likely to win a toss, each has probability:

(A) 1
(B) 3
(C) 1/3
(D) 0

Correct Answer: C

Explanation: If three names are equally likely, each simple event has probability 1/3.

96. Relative frequency of heads in 150 tosses with 70 heads is:

(A) 70
(B) 150/70
(C) 1/2 exactly as a count
(D) 70/150 ≈ 0.467

Correct Answer: D

Explanation: Empirical estimate 70/150, which is near but not forced to equal 1/2.

97. If 5 students in a class of 30 are absent, p = 1/6. In 12 such classes the expected number absent is:

(A) 60
(B) 5
(C) 30
(D) 12

Correct Answer: A

Explanation: Expected absences are 60 because n = 12 × 30 = 360 students and 360 × 1/6 = 60.

98. A bag holds 5 red and 7 blue marbles. P(red) is:

(A) 5/7
(B) 5/12
(C) 7/12
(D) 1

Correct Answer: B

Explanation: A bag holds 5 red and 7 blue marbles. P(red) is 5/12.

99. For that bag, P(not red) is:

(A) 5/12
(B) 1
(C) 7/12
(D) 0

Correct Answer: C

Explanation: Complement: 1 − 5/12 = 7/12, which is also the blue count over 12.

100. Expected frequency cannot be negative because n and p are:

(A) both negative
(B) always 2
(C) class marks
(D) $n \geq 0$ and $0 \leq p \leq 1$

Correct Answer: D

Explanation: Their product n p is between 0 and n.

101. If you want 90 expected sixes from a fair die, you should roll it about:

(A) 540 times, because 90 = n/6 so n = 540
(B) 90 times
(C) 15 times
(D) 6 times

Correct Answer: A

Explanation: n p = 90 with p = 1/6 gives n = 540.

102. Choosing a letter at random from ‘BOOK’ , P(O) is:

(A) 1/4
(B) 2/4 = 1/2
(C) 3/4
(D) 0

Correct Answer: B

Explanation: The word BOOK has four letters and O appears twice, so P(O) = 2/4 = 1/2.

103. A one-digit whole number from 0 to 9 is chosen. P(the number is 10) is:

(A) 1/10
(B) 1
(C) 0, because 10 is not a one-digit number
(D) 1/2

Correct Answer: C

Explanation: That outcome is impossible in this sample space.

104. P(additive identity of whole numbers) when picking 0–9 is:

(A) 0
(B) 9/10
(C) 1
(D) 1/10, because that identity is 0

Correct Answer: D

Explanation: The additive identity of whole numbers is 0, one outcome among the ten digits 0–9.

105. A frequency table with columns x, f and cf is enough to read off a discrete median as the x whose cf first:

(A) reaches n/2
(B) equals 0
(C) equals the mode
(D) equals h

Correct Answer: A

Explanation: The n/2 th item sits in the first row whose running total is at least n/2.

106. Check-point tasks that count letters or vowels in each word produce:

(A) grouped continuous histograms of heights
(B) discrete frequency distributions
(C) SAS triangles
(D) class boundaries of 0.5 always

Correct Answer: B

Explanation: Letter counts are small whole numbers, so a discrete.

107. If mean = 20 and mode = 14, empirical median is:

(A) 16
(B) 17
(C) 18
(D) 6

Correct Answer: C

Explanation: The empirical median is 18 because (mode + 2 mean)/3 = (14 + 40)/3 = 18.

108. Closing a frequency polygon on the axis is done so that the figure is a:

(A) histogram bar
(B) circle
(C) single ray
(D) many-sided closed polygon

Correct Answer: D

Explanation: A polygon, by the unit's wording, is a closed many-sided.