ILLAWARRA TUTORING

This worksheet focuses on relative frequency. You will learn how experimental probability is interpreted as relative frequency through your own investigations. Answer each question carefully and show your working wherever required.

Easy Questions

1. You toss a coin 10 times and observe that heads occur in 6 out of 10 tosses. Calculate the relative frequency of heads.

2. In a jar there are many marbles. You select marbles randomly and count that blue marbles appear 8 times out of 20 selections. Determine the relative frequency of selecting a blue marble.

3. A die is rolled 12 times and the result six appears 3 times. Find the relative frequency for rolling a six.

4. In an experiment, 5 students solve a puzzle correctly out of 10 attempts. Determine the relative frequency of correct solutions.

5. In a survey, 15 people vote for a candidate out of 25 total voters. Compute the relative frequency of votes for the candidate.

Intermediate Questions

6. In an experiment measuring temperature, on 20 days out of 50 the temperature exceeds 30°C. Determine the relative frequency of days exceeding 30°C.

7. A student observes red cars passing by. Out of 100 observations, 35 are red. Calculate the relative frequency of red cars.

8. In an investigation involving coins, 4 counterfeit coins are found in a sample of 40. Compute the relative frequency of counterfeit coins.

9. In a series of 30 lab experiments, a reaction occurs 18 times. Determine the relative frequency of the reaction occurring.

10. A botanist records observing a rare species on 7 occasions out of 28 plant observations. Calculate the relative frequency of this rare occurrence.

11. During a month, rainfall is recorded on 12 out of 48 days. Find the relative frequency of days with rainfall.

12. In an experiment testing battery life, 20 out of 25 batteries last more than 5 hours. Compute the relative frequency of batteries lasting more than 5 hours.

13. In a taste test, 45 out of 60 students like a new ice cream flavour. Determine the relative frequency of students who like the flavour.

14. A wildlife observer records a bird sighting on 16 out of 80 days. Calculate the relative frequency of observing the bird.

15. A teacher grades 18 quizzes as excellent out of 30 quizzes. Compute the relative frequency of excellent quizzes.

16. During an investigation of weather, it rains on 11 out of 55 days. Find the relative frequency of rainy days.

17. In a recycling survey, 27 out of 90 houses recycle regularly. Determine the relative frequency of houses that recycle.

18. In a bouncing ball experiment with 36 trials, the ball bounces exactly three times in 9 of them. Calculate the relative frequency of these trials.

19. In a classroom experiment, 22 out of 55 students prefer studying in the morning. Compute the relative frequency of students with this preference.

20. An athlete completes a time trial under 10 seconds in 12 out of 40 attempts. Determine the relative frequency of such successful attempts.

Hard Questions

21. A coin was flipped multiple times in 10 separate experiments. The observed relative frequencies of heads are: 0.48, 0.52, 0.50, 0.46, 0.54, 0.51, 0.49, 0.47, 0.53, 0.50. Calculate the overall experimental probability of heads by determining the average relative frequency.

22. In 7 experiments, the number of occurrences of a certain event are recorded as 3, 5, 4, 6, 2, 7, and 4. Each experiment consists of 20 trials. Compute the overall relative frequency of the event.

23. A survey is conducted in 15 gardens, each monitored for 50 days. If a specific bug is observed on 60 days in total, determine the relative frequency of days with the bug.

24. A researcher first rolls a die 80 times and obtains 10 occurrences of a six. Later, after 200 rolls, the relative frequency of rolling a six is 0.135. Calculate the number of sixes obtained in the second set of experiments.

25. In a rollercoaster study, the number of times a person screams during each of 16 rides is recorded as follows:

    $$3,\ 2,\ 4,\ 3,\ 5,\ 3,\ 2,\ 3,\ 4,\ 2,\ 3,\ 3,\ 4,\ 5,\ 3,\ 2$$

    A scream is considered to have occurred if the count is above 3. Determine the relative frequency of rides in which a scream (i.e. a count of 4 or 5) is observed.

26. In a quality control test consisting of 12 batches, the relative frequency of defective items in each batch is recorded as: 0.05, 0.1, 0.08, 0.12, 0.07, 0.09, 0.11, 0.06, 0.1, 0.08, 0.09, 0.07. Calculate the overall relative frequency of defects by averaging these values.

27. A survey records the relative frequency of rainy days for each month in a year. The recorded values are: 0.2, 0.15, 0.25, 0.3, 0.1, 0.15, 0.22, 0.18, 0.27, 0.23, 0.19, 0.24. Determine the overall relative frequency of rainy days for the year by computing the average.

28. A scientist performs 500 experiments and observes that a rare event occurs 47 times. In another series of 500 experiments, the relative frequency is observed to be 0.11. Calculate the number of times the event occurred in the second series.

29. An experiment on a chemical reaction is carried out in 3 separate trials. In each trial consisting of 30 experiments, the reaction occurred 12, 15, and 9 times respectively. Determine the overall experimental probability of the reaction by calculating the cumulative relative frequency.

30. Over 10 weeks, the relative frequencies of chalk usage in a classroom are recorded as: 0.5, 0.6, 0.45, 0.55, 0.65, 0.5, 0.7, 0.6, 0.55, 0.65. Compute the overall average relative frequency of chalk usage.