

Solutions for Rumack's Preparation Workbook: 1.6

1. To find the total, set up an equation and solve. $Total \div Size = Average, Total \div 8 = 7.5, Total = 7.5 \times 8 = 60.0$. The answer is (D).

2. To figure out the percentage, set up an equation. $1st\ Slice + 2nd\ Slice + 3rd\ Slice = 100\%$. If the third slice represents 40% or more, the sum of the first two slices represents 60% or less, because $100\% - 40\% = 60\%$. Since the first two slices are equal, $2 \times (1st\ Slice) = 60\%$ or less. $1st\ Slice = (60 \div 2)\%$ or less. $1st\ Slice = 30\%$ or less. The answer is (C).

3. To find the average, add all the numbers and divide the sum by the size of the group. To find the most common number, observe which number appears the most often. $Average = Total \div Size = (8 + 11 + 21 + 12 + 8) \div 5 = 60 \div 5 = 12$. The most common number is 8 because it appears twice, while all other numbers appear once each. The answer is (C).

4. To find the average, add all the numbers and divide the sum by the size of the group. To find the range, subtract the smallest number from the largest number. $Average = Total \div Size = (4 + 6 + 9 + 12 + 26) \div 5 = 57 \div 5 = 11.4$. $Range = Largest\ number - Smallest\ number = 26 - 4 = 22$. The answer is (E) None of the above.

5. To find out what characteristics the average will have, try a simple example:

$Average = \left(\begin{array}{l} \text{Four consecutive numbers} \\ \text{greater than 10} \end{array} \right) \div 4 = (12 + 14 + 16 + 18) \div 4 = 60 \div 4 = 15$. This is an odd number, and none of the other choices describe this number. The answer is (B).

6. To find the ratio, write down all known information and simplify. Since $Average = Total \div Size$, $Total = Average \times Size$. Find the ratios of their total measurements. $Total_B : Total_A = Average_B \times Size_A \times 2 : Average_A \times Size_A = 2 : 1$. The answer is (D).

7. To calculate the amount, estimate what percentage of the pie chart contains the given fees and multiply by the total amount of money. Then choose the closest answer. Because the cell phone and computer fees occupy a little more than half of the pie chart, let's estimate that the percentage is approximately 55%. $55\% \times \$1800 = 0.55 \times \$1800 = \$990$. \$990 is between (C) \$900 and (D) \$1200, but it is closer to \$900. The answer is (C).

8. To find the range, subtract the smallest number from the largest number.

$Range = Largest\ number - Smallest\ number = (5\ more\ than\ \$25) - (3\ less\ than\ 20) = (25 + 5) - (20 - 3) = 30 - 17 = 13$. The answer is (A).

9. To find the total, set up an equation and solve. $Total \div Size = Average, Total \div 6 = 14$, $Total = 14 \times 6 = 84$. The answer is (A).

10. To find the mean, add all the numbers and divide the sum by the size of the group. $Mean = Total \div Size = (4 + 5 + 9 + 10 + 12 + 14) \div 6 = 54 \div 6 = 9$. To find the range, subtract the smallest

number from the largest number. $Range = Largest\ number - Smallest\ number = 14 - 4 = 10$. The answer is (B).

11. To find the mean, add all the numbers and divide the sum by the size of the group. To find the mode, observe which number appears the most often in the data set. $Mean = Total \div Size = (6 + 7 + 8 + 9 + 12 + 12) \div 6 = 54 \div 6 = 9$. The mode is 12 because it appears twice in the data set, while all other numbers appear once each. The answer is (A).

12. To find the probability as a percentage, divide the number of specific outcomes by the total number of outcomes and then convert the answer into a percentage. Note that all outcomes are equally likely because it is a regular pentagon. $Probability = \frac{Number\ of\ specific\ outcomes}{Total\ number\ of\ outcomes} = \frac{2}{5} = 2 \div 5 = 0.4 = 40\%$. The answer is (E).

13. To find her new average, find the total of her first 3 tests, add the score of her fourth test, and then divide this sum by the number of tests. First three tests: $Average = Total \div Size, 74 = Total \div 3, Total = 74 \times 3 = 222$. After the fourth test: $Average = Total \div Size = (222 + 78) \div 4 = 300 \div 4 = 75$. The answer is (D).

14. To find the probability, divide the number of specific outcomes by the number of outcomes. Since the grid is 5×5 , we know that there are 25 squares in it. $Probability = \frac{Number\ of\ specific\ outcomes}{Total\ number\ of\ outcomes} = \frac{5}{25} = \frac{5 \div 5}{25 \div 5} = \frac{1}{5}$. The answer is (B).

15. To find the number of measures in the set, set up an equation and solve for size. $Average = Total \div Size, 22 = 110 \div Size, 22 \times Size = 110, Size = 110 \div 22, Size = 5$. The answer is (E).

16. To find the larger value, take the smaller of the two largest values, and add the difference between these two values. $Larger\ value = Smaller\ value + Difference = 65 + 23 = 88$. The answer is (B).

17. The smallest value and the largest value have changed, so the range has changed. The statement in (A) is always true.

18. To find the last number in the set, set up an equation and solve. Let N represent the unknown number. $Average = \frac{Total}{Size}, 12.2 = (8 + 11 + 16 + 4 + N) \div 5, 12.2 = (39 + N) \div 5, 12.2 \times 5 = (39 + N), 61 = 39 + N, N = 61 - 39 = 22$. The answer is (B).

19. To find the average, add up the factors and then divide the sum by the number of factors. Factors of 20: {1, 2, 4, 5, 10, 20}. $Average = Total \div Size = (1 + 2 + 4 + 5 + 10 + 20) \div 6 = 42 \div 6 = 7$. The answer is (D).

20. To find the probability, determine the number of integers and divide by the total number of outcomes. There are 4 integers: 11, 17, 19 and 16. $Probability = \frac{Number\ of\ specific\ outcomes}{Total\ number\ of\ outcomes} = \frac{4}{8} = \frac{1}{2} = 0.5 = 50\%$. The answer is (D).

21. To find how much greater the first average is than the second average, find both and then divide the first by the second. $First\ Average = First\ total \div First\ size = (100 + 150 + 350 + 500) \div 4 = 1100 \div 4 = 275$. $Second\ average = Second\ total \div Second\ size = (10 + 15 + 25 + 50) \div 4 = 100 \div 4 = 25$. $\frac{First\ Average}{Second\ Average} = \frac{275}{25} = 11$. The answer is (B).

22. To find the mean, add up the factors and divide the sum by the number of factors. To find the range, subtract the smallest factor from the largest factor. Factors of 32: {1, 2, 4, 8, 16, 32}. $Mean = Total \div Size = (1 + 2 + 4 + 8 + 16 + 32) \div 6 = 63 \div 6 = 10.5$. $Range = Largest\ factor - Smallest\ factor = 32 - 1 = 31$. The answer is (D).

23. To find the difference, find the two totals and subtract. $Average_A = Total_A \div Size_A$, $35 = Total_A \div 10$, $Total_A = 35 \times 10 = 350$. $Average_B = Total_B \div Size_B$, $25 = Total_B \div 10$, $Total_B = 25 \times 10 = 250$. The difference between both totals is 100. The answer is (D).

24. To find the right answer, figure out any known characteristics about the mean and the mode. "Multiple of 2" means even number. Since the size of the group is not known, the mean could be even or odd. There is no mode since the numbers must all be different. The answer is (E).

25. To find the probability of two different events occurring, define the specific outcomes, draw a tree diagram, and identify the number of specific outcomes and the total number of outcomes. Factors of 6: {1, 2, 3, 6}. $Probability = \frac{Number\ of\ specific\ outcomes}{Total\ number\ of\ outcomes} = \frac{4}{12} = \frac{1}{3}$. The answer is (D).