MATHCOUNTS® Problem of the Week Archive

Final Exams – May 23, 2022

Problems & Solutions

Joseph scored 76, 88, 96 and 98 on his 4 chapter tests this grading period. If the final exam will count twice as much as each of the chapter tests, and the 4 tests and the final exam are the only items contributing to this period's grade, what is the minimum number score that Joseph must earn on the final to have an average of 94?

Let's call the final exam score Joseph must earn in order to get the desired average x. Since Joseph scored 76, 88, 96 and 98 on his 4 chapter tests, and the final exam will count twice as must as each of the chapter tests, we can set up the following equation: (76 + 88 + 96 + 98 + x + x)/6 = 94. Now, we can solve for x: 358 + 2x = 94 × 6 → 358 + 2x = 564 → 2x = 206 → x = 103. So, Joseph must earn a minimum score of ***103*** *on the final.*

The final exam scores earned by the 16 students in Joseph's class are as follows: 80, 79, 96, 93, 94, 92, 88, 87, 90, 81, 83, 82, 89, 99, 91, 73. What is the positive difference between the median of these scores and the average (arithmetic mean) of these scores? Express your answer as a decimal to the nearest hundredth.

First, let's find the average of these 16 scores. The sum of the 16 scores is 80 + 79 + 96 + 93 + 94 + 92 + 88 + 87 + 90 + 81 + 83 + 82 + 89 + 99 + 91 + 73 = 1397, so the average is 1397/16 = 87.3125. Now, let's put the scores in order from least to greatest to find the median: 73, 79, 80, 81, 82, 83, 87, 88, 89, 90, 91, 92, 93, 94, 96, 99. Since there is an even number of numbers, we must average the middle two scores: (88 + 89)/2 = 88.5. Thus, the positive difference between the median and the average of these scores is 88.5 – 87.3125 = 1.1875, which is ***1.19*** *rounded to the nearest hundredth.*

In another one of Joseph's classes the 14 8^{th} graders averaged 94 on the final exam, while the 12 7^{th} graders averaged 89 on the final exam. What was the average score for the entire class? Express your answer as a decimal to the nearest hundredth.

The sum of the scores that the 8^{th} graders earned is 14(94) = 1316. The sum of the scores that the 7^{th} graders earned is 12(89) = 1068. This means that the sum of the scores of the entire class is 1316 + 1068 = 2384, which gives an average of 2384/(14 + 12) ≈ ***91.69****.*

MATHCOUNTS® Problem of the Week Archive

Final Exams – May 23, 2022

Problems

Joseph scored 76, 88, 96 and 98 on his 4 chapter tests this grading period. If the final exam will count twice as much as each of the chapter tests, and the 4 tests and the final exam are the only items contributing to this period's grade, what is the minimum number score that Joseph must earn on the final to have an average of 94? Express your answer as a decimal to the nearest tenth.

The final exam scores earned by the 16 students in Joseph's class are as follows: 80, 79, 96, 93, 94, 92, 88, 87, 90, 81, 83, 82, 89, 99, 91, 73. What is the positive difference between the median of these scores and the average (arithmetic mean) of these scores? Express your answer as a decimal to the nearest hundredth.

In another one of Joseph's classes the 14 8^{th} graders averaged 94 on the final exam, while the 12 7^{th} graders averaged 89 on the final exam. What was the average score for the entire class? Express your answer as a decimal to the nearest hundredth.