

# MATHCOUNTS<sup>®</sup> Problem of the Week Archive

## 1<sup>st</sup> Quarter Grades – October 10, 2022

### Problems & Solutions

Amanda's overall first quarter grade for Biology is determined based on her performance in each of four areas and is weighted as follows:

Participation	10%
Homework	15%
Quizzes	25%
Tests	50%
<hr/>	
	100%

Based on this, for what percent of her overall first quarter average will each of Amanda's six Biology quiz scores account? Express your answer to the nearest tenth.

*If, together, the six quizzes account for 25% of Amanda's overall first quarter average, it follows that each quiz accounts for  $25 \div 6 \approx 4.2\%$  of her overall average.*

Amanda scored 72, 86, 94 and 88 on the first four Biology tests this quarter. If each test is worth 100 points, what is the maximum test average with which Amanda can end the quarter after she takes the fifth test?

*Since the highest score Amanda can earn on the final test is 100, her maximum possible test average is  $(72 + 86 + 94 + 88 + 100) \div 5 = 440 \div 5 = 88$ .*

Amanda's Biology teacher decided to drop each student's lowest test score before calculating the overall first quarter average for each student. After dropping the lowest of Amanda's five test scores, the average of her remaining four tests was 90. What is the positive difference between the highest and lowest of Amanda's five test scores?

*If Amanda's fifth test score were her lowest, her test average would have been  $(72 + 86 + 94 + 88) \div 4 = 340 \div 4 = 85$ . But we are told that the average of the remaining four tests is 90. Therefore, her lowest test score must have been 72. If we let  $n$  represent her fifth test score, we can write  $(86 + 94 + 88 + n) \div 4 = 90$ . Solving for  $n$ , we have  $(268 + n) \div 4 = 90 \rightarrow 268 + n = 360 \rightarrow n = 92$ . Thus, Amanda's highest test score was 94, and the positive difference between her highest and lowest test scores is  $94 - 72 = 22$ .*

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