

This practice plan was created by **Taren Long**, a math teacher and coach at Chesapeake Public Charter School. Taren created numerous free resources for MATHCOUNTS coaches in her role as the 2020-2021 DoD STEM Ambassador for MATHCOUNTS. Find more resources and information at dodstem.us.

Averages



Warm-Up!

Try these problems before watching the lesson.

1. In the set 2, 5, 11, 17, 20, what is the difference between the mean and the median?
2. What is the average of the integers from 13 to 31, inclusive?
3. If the average of 20 numbers is 16, what is their sum?
4. What is the mean of $3x$, $4x - 5$ and $2x - 1$?
5. What is the mean of all three-digit numbers that can be created using each of the digits 1, 2 and 3 exactly once?



The Problems

Take a look at the following problems and follow along as they are explained in the video.

6. What is the mean of seven numbers if the mean of the first two is 11 and the mean of the last five is 18?
7. Hadley scored 92, 73, 79 and 87 points on the first four tests of the quarter. There is one test remaining. What is the minimum number of points that Hadley must score on the final test in order to have a mean of 80 points for the five tests?

8. The arithmetic mean of four numbers is 15. Two of the numbers are 10 and 18 and the other two are equal. What is the product of the two equal numbers?



Piece It Together

Use the skills you practiced in the warm-up and strategies from the video to solve the following problems.

9. Louis received grades of 75, 90 and 81 on his unit tests. The final exam is worth three times as much as a unit test. What grade must Louis make on the final exam to end up with an average of 86 on all his tests?
10. The mean of four distinct positive integers is 5. If the largest of these four integers is 13, what is the smallest of the four integers?
11. From 11 positive integer scores on a 10-point quiz, the mean is 8, the median is 8, and the mode is 7. Find the maximum number of perfect scores possible on this test.
12. The mean of six positive integers is 5 and the median is 6. What is the largest the mode could be, given that the mode is unique?



Optional Extension

To extend your understanding and have a little fun with math, try the following activities.

There are quick ways to add sequences of numbers, which makes finding the mean of a sequence of numbers much easier. Try to come up with a formula or strategy to figure out the average of any consecutive sequence of numbers.

Consider:

- Sequences with an odd or even number of terms.
- Sequences that begin with 1 and sequences that do not begin with 1.
- Sequences of only odd numbers or only even numbers (or otherwise non-consecutive sequences).