

Lesson #1

Finding the Score Needed to Obtain a Particular Mean (Average)

The general formula for finding a mean is:

$$\text{Mean} = \frac{\text{Sum of Scores}}{\text{Number of Scores}}$$

However, we are often asked more complicated questions, like this:

- “Bob has received test grades of 84, 92, 89 and 74. What will he need on the fifth test to achieve a mean of 86?”
 - “For his first 6 golf games, Nick has a total combined score of 462. What score would he need on his next golf game to have an average score of 76?”
 - “Sadie has an average of 84% after taking 8 chemistry tests. What grade would she need on her next test to bump her average up to 85%?”
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The key to solving these more involved problems is to use a slightly more complicated formula. You will need to know 3 things:

- A) What is our desired mean/average?
- B) What is the sum of all the scores we have?
- C) How many scores/test grades will we have?

$$\text{Desired Mean} = \frac{\text{Current Sum of Scores} + x}{\text{Total Number of Scores}}$$

Where x = the final score needed to achieve the desired mean

Using the Formula

Sample Question: Bob has received test grades of 84, 92, 89 and 74. What will he need on the fifth test to achieve a mean of 86?

Solution: We gather the required information. Our desired mean is **86**. The sum of the scores we have is $84+92+89+74 = 339$. We have 4 scores and want the mean for a total of **5** tests.

We now substitute this info into our formula and solve for x:

$$\text{Desired Mean} = \frac{\text{Current Sum of Scores} + x}{\text{Total Number of Scores}}$$

$$86 = \frac{339 + x}{5}$$

$$430 = 339 + x$$

$$91 = x$$

Bob needs a score of 91 on his fifth test to achieve a mean of 86

Sample Question: For his first 6 golf games, Nick has a total combined score of 462. What score would he need on his next golf game to have an average score of 76?

Solution: We gather the required information. Our desired mean is **76**. The sum of the scores we have is given as **462**. We have 6 scores and want the mean for a total of **7** games.

We now substitute this info into our formula and solve for x:

$$\text{Desired Mean} = \frac{\text{Current Sum of Scores} + x}{\text{Total Number of Scores}}$$

$$76 = \frac{462 + x}{7}$$

$$532 = 462 + x$$

$$70 = x$$

Nick needs to get a 70 on his next golf game to have an average of 76

Sample Question: Sadie has an average of 84% after taking 8 chemistry tests. What grade would she need on her next test to bump her average up to 85%?

Solution: We gather the required information. Our desired mean is **85**. The sum of the current scores is $84 * 8 = \mathbf{672}$. We have 8 scores and want the mean for a total of **9** tests.

We now substitute this info into our formula and solve for x:

$$\text{Desired Mean} = \frac{\text{Current Sum of Scores} + x}{\text{Total Number of Scores}}$$

$$85 = \frac{672 + x}{9}$$

$$765 = 672 + x$$

$$93 = x$$

Sadie needs a 93% on her next test to obtain a new average of 85%