

Weighted Averages

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For some averages, greater "Weight" is given to each element individually. The frequency or likelihood of the elements is considered.

Example 1: 3 books cost \$6 each, 4 books cost \$10 each and 5 books cost \$12 each. What is the average cost per book?

Answer: It's not $(\$6 + \$10 + \$12) \div 3$ because there are different amounts of books and each book has a different price.

Factoring "Weights" the equation looks like

$$\frac{3(\$6) + 4(\$10) + 5(\$12)}{3 + 4 + 5}$$

$$\frac{18 + 40 + 60}{12} = \frac{118}{12} = \$9.84$$

To find weighted averages, multiply each number in the set by the number of times it appears in the set. Finally, add them all up and divide by the total number of items.

Example 2 In a group of ten students, 7 are 13 and 3 are 17. What is the average age of the students?

ANSWER $\left[(7 \times 13) + (3 \times 17) \right] \div 10 = 14.2$

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Example 3: The final exam is worth twice the weight of the other two mid-terms. Mid-term one score is 75, mid-term 2 score is 85 and FINAL score is 90. What is the average for the class.

ANSWER:
$$\frac{75 + 85 + 2(90)}{4} = 85$$

You divide by 4 and NOT 3 because final is worth 2 tests

Important Note about Averages

"You can't average averages"

If your batting average is 0.250 the first half of the season and your average for the second half is 0.350 your average for the season is not $(0.250 + 0.350) \div 2$.

You may have had 100 at bats the first half of the season and only 10 at bats the second half.

You have to take your total hits and divide by your TOTAL at bats to find out your average for the season.
