

NEW ATTEMPT AT CALCULATION• GOAL :

Want to try to recalculate "High Average Class Length", this time using concept of weighted averages.

NOTE: (1) See Page 4 of PDF I uploaded with my initial post for my original attempt at this calculation.

(2) Raw data comes from Page 3 of ^{that} PDF.

• NEW CALCULATION ATTEMPT:

Calculation of "High Average Class Length" uses the following sets of data (units in hours per class):

SET ① (PHYSICS): 1, 1, 1, 3
 SET ② (ENGINEERING): 1.5, 1.5, 3
 SET ③ (CHEMISTRY): 1, 1, 1, 3
 SET ④ (MATH): 1, 1, 1
 SET ⑤ (ENGLISH): 1, 1, 1

• Raw data from Page #3 of PDF I uploaded in my initial post for this thread.

• Total number of classes: $12+3+2=17$

What I did : What if I first calculate the averages for each individual subject and then find the ^{overall} weighted average?

And if I try to calculate the overall weighted average directly, without using the individual averages, then why are the final answers different when they should be identical?

Calculations:

- For SET ①:

Average class
length for
Physics classes

$$= \frac{(1 \text{ h/class} \times 3 \text{ classes}) + (3 \text{ h/class} \times 1 \text{ class})}{3 \text{ classes} + 1 \text{ class}}$$

$$= 1.5 \text{ h/class}$$

- For SET ②:

Average class
length for
Engineering
classes

$$= \frac{(1.5 \times 2) + (3 \times 1)}{2 + 1}$$

$$= \frac{13}{6}$$

$$= 2.1\bar{6}$$

- For SET ③:

Average class
length for
Chemistry
classes

$$= \frac{(1 \times 3) + (3 \times 1)}{3 + 1}$$

$$= 1.5$$

- For SET ④:

Average class
length for
Math classes

$$= \frac{(1 \times 3)}{3}$$

$$= 1$$

• For SET ⑤:

$$\text{Average class length for English classes} = \frac{(1 \times 3)}{3}$$

$$= 1$$

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$$\text{Weighted average of averages of SETS ① to ⑤} = \frac{(1.5 + \frac{13}{6} + 1.5 + 1 + 1) h/\text{class}}{1 + 1 + 1 + 1 + 1}$$

$$= 1.4\bar{3} \text{ h/class}$$

But what happens if you calculate the weighted average directly from the raw data, instead of <sup>Fig 3</sup> the individual averages of each subject?

NOTE:  
Same method I used on Page 4 of the PDF I uploaded in my original post.

Weighted average of data in SETS ① to ⑤

$$= \frac{(1h \times 12) + (3h \times 2) + (1.5h \times 2)}{(12 + 3 + 2) \text{ classes}}$$

$$= \frac{24}{17} \text{ h/class}$$

$$= 1.4117\ldots \text{ h/class}$$



Why are these answers different (i.e.  $1.4\bar{3} \neq 1.4117\ldots$ )?  
I used the same methodology you did in your example.