Problem of the Week
Problem C and Solution
A Reporting Problem

Problem
Mildred has seven grades on her report card. The overall average of these seven grades is 77%. After looking more closely at her report card, Mildred discovered that her English grade was incorrectly recorded as 18% instead of her actual grade of 81%. Determine Mildred’s correct report card average.

Solution
Solution 1
This first solution works primarily with the definition of an average.
To calculate an average we add the seven grades and divide by 7.
\[
\frac{\text{sum of seven grades}}{7} = 77
\]
To then obtain the sum of the seven grades we would multiply the average by 7.
\[
\text{sum of seven grades} = 7 \times 77 = 539
\]
But this sum includes the wrong English grade of 18%. So we need to adjust the sum by subtracting the wrong grade and adding the corrected grade.
\[
\text{correct sum of seven grades} = 539 - 18 + 81 = 602
\]
We can now obtain Mildred’s corrected average by dividing the corrected sum by 7.
\[
\text{correct average} = \frac{\text{correct sum of seven grades}}{7} = \frac{602}{7} = 86
\]
\[\therefore\] Mildred’s corrected report card average is 86%.

Solution 2
The second solution looks at how an increase in a grade will affect an overall average.
For an average based on seven grades, an increase of 1% for one grade will cause the overall average to increase by \(\frac{1}{7}\) of 1%. So, for each increase of 7%, the overall average will increase by 1%. That is, Mildred’s mark will increase by 1% for every 7% her English grade increases by.
Mildred’s English grade increases by 81% - 18% = 63%. Since 63 ÷ 7 = 9, her average will increase by 9% to 86%.
\[\therefore\] Mildred’s corrected report card average is 86%.