Solution for exercise 3.2.2 in Pitman

Let us denote the numbers on the first list by x_i and the numbers on the second list by y_i The average of the first list is $1 \cdot 0.2 + 2 \cdot 0.8 = 1.8$. The average of the second list is $3 \cdot 0.5 + 5 \cdot 0.5 = 4.0$.

Question a) The average of the list made by addition is 5.8. This can be seen by

$$\frac{1}{100}\sum_{i=1}^{100}(x_i + y_i) = \frac{1}{100}\sum_{i=1}^{100} x_i + \frac{1}{100}\sum_{i=1}^{100} y_i$$

Question b) The average of the list made by subtraction is -2.2 by the same approach.

Question c) The average in question is

$$\frac{1}{100}\sum_{i=1}^{100} x_i y_i$$

and we need some information on the ordering to calculate the sum, thus we do not have sufficient information.

Question d) As c).