Congratulations! You passed!

Grade received 100% **To pass** 80% or higher

Go to next item

1. What is the mean of the dataset $\mathcal{D} = \{1, 2, 3\}$? **1 / 1 point**

Do the exercises using pen and paper.

- 6
- (•) 2
- 3

Correct
That's it. Good job!

2. Compute the mean of the following dataset: **1 / 1 point**

$$\mathcal{D} = \left\{ \begin{bmatrix} 1 \\ 4 \\ 7 \end{bmatrix}, \begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}, \begin{bmatrix} 3 \\ 6 \\ 9 \end{bmatrix} \right\}$$

Do the exercises using pen and paper.

- $\begin{bmatrix} 6 \\ 15 \\ 24 \end{bmatrix}$
- (•) $\begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}$
- $\begin{bmatrix} -2 \\ -5 \\ -8 \end{bmatrix}$

Correct
Well done!

3. What is the mean of the following dataset, **after** multiplying each sample in the dataset by 2? **1 / 1 point**

$$\mathcal{D} = \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}, \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix} \right\}$$

- $\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$
- (•) $\begin{bmatrix} 6 \\ 6 \\ 6 \end{bmatrix}$
- $\begin{bmatrix} 18 \\ 18 \\ 18 \end{bmatrix}$

Correct
Well done!

4. What is the mean of the following dataset, **after** adding $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ to each sample in the following dataset? **1 / 1 point**

$$\mathcal{D} = \left\{ \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 5 \end{bmatrix}, \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix} \right\}$$

- $\begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$
- (•) $\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$
- $\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$

Correct
Well done!

5. Assuming that we know the mean $\bar{x}_{n-1}$ of a dataset $\mathcal{D}_{n-1}$ with $n-1$ data points. Now, suppose that we collect another data point, which we denote by x_*. Select the correct formula that computes the correct new mean $\bar{x}_n$ of the full data set $\mathcal{D}_n = \mathcal{D}_{n-1} \cup \{x_*\}$, i.e., we add x_* to the dataset $\mathcal{D}$. **1 / 1 point**

- $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n-1}(x_* - \bar{x}_{n-1})$
- $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n+1}(x_* - \bar{x}_{n-1})$
- (•) $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n}(x_* - \bar{x}_{n-1})$
- $\bar{x}_n = \bar{x}_{n-1} + \frac{1}{n+1}(\bar{x}_{n-1} - x_*)$

Correct
Excellent!

6. Assuming you are given an image as a two dimensional array of shape 28 x 28. Write a small piece of python code to reshape this image to a vector of length 784 (=28 x 28). **1 / 1 point**

Hint: This can be a one-liner.

```
import numpy as np

def reshape(x):
  """return x_reshaped as a flattened vector of the multi-dimensional array x""
  x_reshaped = np.concatenate(x)
  return x_reshaped

```

Run

Reset

Correct

Good job!