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

Do the exercises using pen and paper.

- ○ 3
- ○ 6
- ◉ 2

**Correcto**
That's it. Good job!

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

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

Do the exercises using pen and paper.

- ○ $\begin{bmatrix}6\\15\\24\end{bmatrix}$
- ○ $\begin{bmatrix}-2\\-5\\-8\end{bmatrix}$
- ◉ $\begin{bmatrix}2\\5\\8\end{bmatrix}$

**Correcto**
Well done!

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

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

- ○ $\begin{bmatrix}3\\3\\3\end{bmatrix}$
- ○ $\begin{bmatrix}18\\18\\18\end{bmatrix}$
- ◉ $\begin{bmatrix}6\\6\\6\end{bmatrix}$

**Correcto**
Well done!

**4.** **1 / 1 punto**

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

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

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

**Correcto**
Well done!

**5.** **1 / 1 punto**

Assuming that we know the mean $\bar{x_{n-1}}$ of a dataset $D_{n-1}$ 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 $D_n = D_{n-1} \cup \{x_*\}$, i.e., we add $x_*$ to the dataset $D$.

- ( ) $\bar{x_n} = \bar{x_{n-1}} + \frac{1}{n-1}(x_* - \bar{x_{n-1}})$
- ( ) $\bar{x_n} = \bar{x_{n-1}} + \frac{1}{n+1}(x_* - \bar{x_{n-1}})$
- ( ) $\bar{x_n} = \bar{x_{n-1}} + \frac{1}{n+1}(\bar{x_{n-1}} - x_*)$
- (●) $\bar{x_n} = \bar{x_{n-1}} + \frac{1}{n}(x_* - \bar{x_{n-1}})$

**Correcto**
Excellent!

**6.** **1 / 1 punto**

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).

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.reshape(x, -1)
  return x_reshaped

```

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**Correcto**

Good job!