Congratulations! You passed!

Grade received 100%
To pass 80% or higher

[**Go to next item**]

---

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

1 / 1 point

Do the exercises using pen and paper.

- ◉ 2
- ○ 6
- ○ 3

✓ **Correct**
That's it. Good job!

---

2. Compute the mean of the following dataset:

1 / 1 point

$$\begin{bmatrix} 1 \\ 4 \\ 7 \end{bmatrix}$$

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

Do the exercises using pen and paper.

◉

$$\begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}$$
$$\begin{bmatrix} 2 \\ 5 \\ 8 \end{bmatrix}$$

○

$$\begin{bmatrix} -2 \\ -5 \\ -8 \end{bmatrix}$$
$$\begin{bmatrix} -2 \\ -5 \\ -8 \end{bmatrix}$$

○

$$\begin{bmatrix} 6 \\ 15 \\ 24 \end{bmatrix}$$
$$\begin{bmatrix} 6 \\ 15 \\ 24 \end{bmatrix}$$

⊘ **Correct**
Well done!

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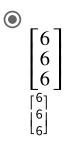
1 / 1 point

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

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

○

$$\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$$

○

$$\begin{bmatrix} 18 \\ 18 \\ 18 \end{bmatrix}$$
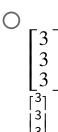
$$\begin{bmatrix} 18 \\ 18 \\ 18 \end{bmatrix}$$

◉

$$\begin{bmatrix} 6 \\ 6 \\ 6 \end{bmatrix}$$

$$\begin{bmatrix} 6 \\ 6 \\ 6 \end{bmatrix}$$

✓ **Correct**

Well done!

4. What is the mean of the following dataset, **after** adding

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ to each sample in the following dataset?

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

○ $\begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$

$\begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$

◉ $\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$

$\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$

○

$$\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 3 \\ 3 \\ 3 \end{bmatrix}$$

✓ **Correct**
Well done!

5. Assuming that we know the mean $\bar{x}_{n-1}$ of a dataset 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.

1 / 1 point

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

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

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

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

✓ **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.

```
1    import numpy as np
2
3    def reshape(x):
```

```
4        """return x_reshaped as a flattened vector of the multi-dimensional array x"""
5        x_reshaped = x.flatten()
6        return x_reshaped
7
```

Run

Reset

No Output

⊘ **Correct**

Good job!