



Activity

Suppose we run the cell below.

```

s = (5, 3)
grid = np.ones(s) * 2 * np.arange(1, 16).reshape(s)
grid[-1, 1:].sum()

```

don't need this



5 rows, 3 cols

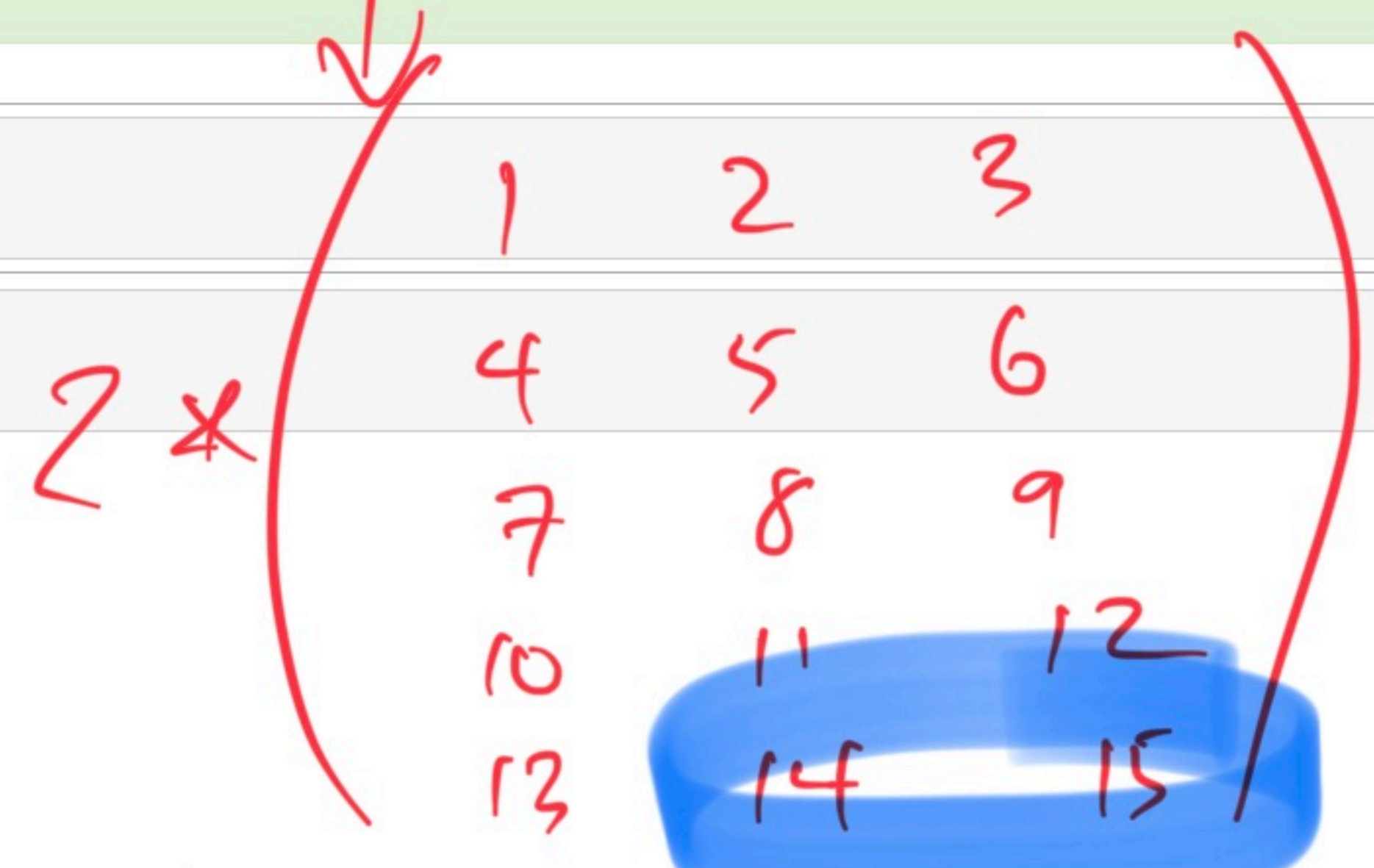
What is the output of the cell? Try and answer without writing any code. See the annotated slides for the solution.

In []:

In []:

*result: 2 * (14 + 15)*

5 8



$$A = \begin{bmatrix} 2 & -5 & 1 \\ 0 & 3 & 2 \end{bmatrix} \quad \vec{x} = \begin{bmatrix} 1 \\ -1 \\ 4 \end{bmatrix} \quad \vec{y} = \begin{bmatrix} 3 \\ -2 \end{bmatrix}$$

(Handwritten annotations: red circles around A and x, blue circles around A and y, red arrows pointing to dimensions 2x3 and 3x1)

```
In [141]: A = np.array([[2, -5, 1],
                       [0, 3, 2]])
          x = np.array([[1],
                       [-1],
                       [4]])
          y = np.array([[3],
                       [-2]])
```

$$A\vec{x} = \begin{bmatrix} 11 \\ 5 \end{bmatrix}$$

(Handwritten in red, circled in blue)

$$\begin{array}{r} 2x \quad -5 \quad 1 \\ 1 \quad -1 \quad 4 \\ \hline 2 + 5 + 4 = 11 \end{array}$$

(Handwritten in red, with 11 circled)

- We can use **numpy** to compute various quantities involving A , \vec{x} , and \vec{y} .

For instance, what is the result of the product $A\vec{x}$?

See the annotated slides for the math worked out.

```
In [142]: A @ x
Out[142]: array([[11],
                [ 5]])
```

$$\begin{array}{r} 0x \quad -3 \quad 8 \\ 0 \quad -1 \quad 4 \\ \hline 0 + -3 + 8 = 5 \end{array}$$

(Handwritten in blue, with 5 boxed)

