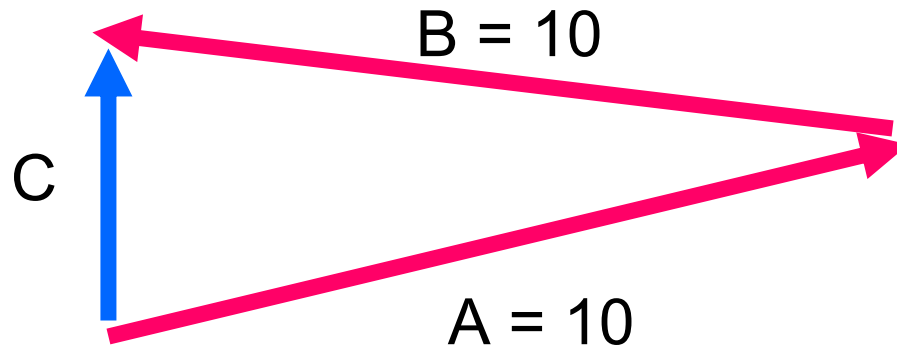- Adding vectors is not the same as adding numbers
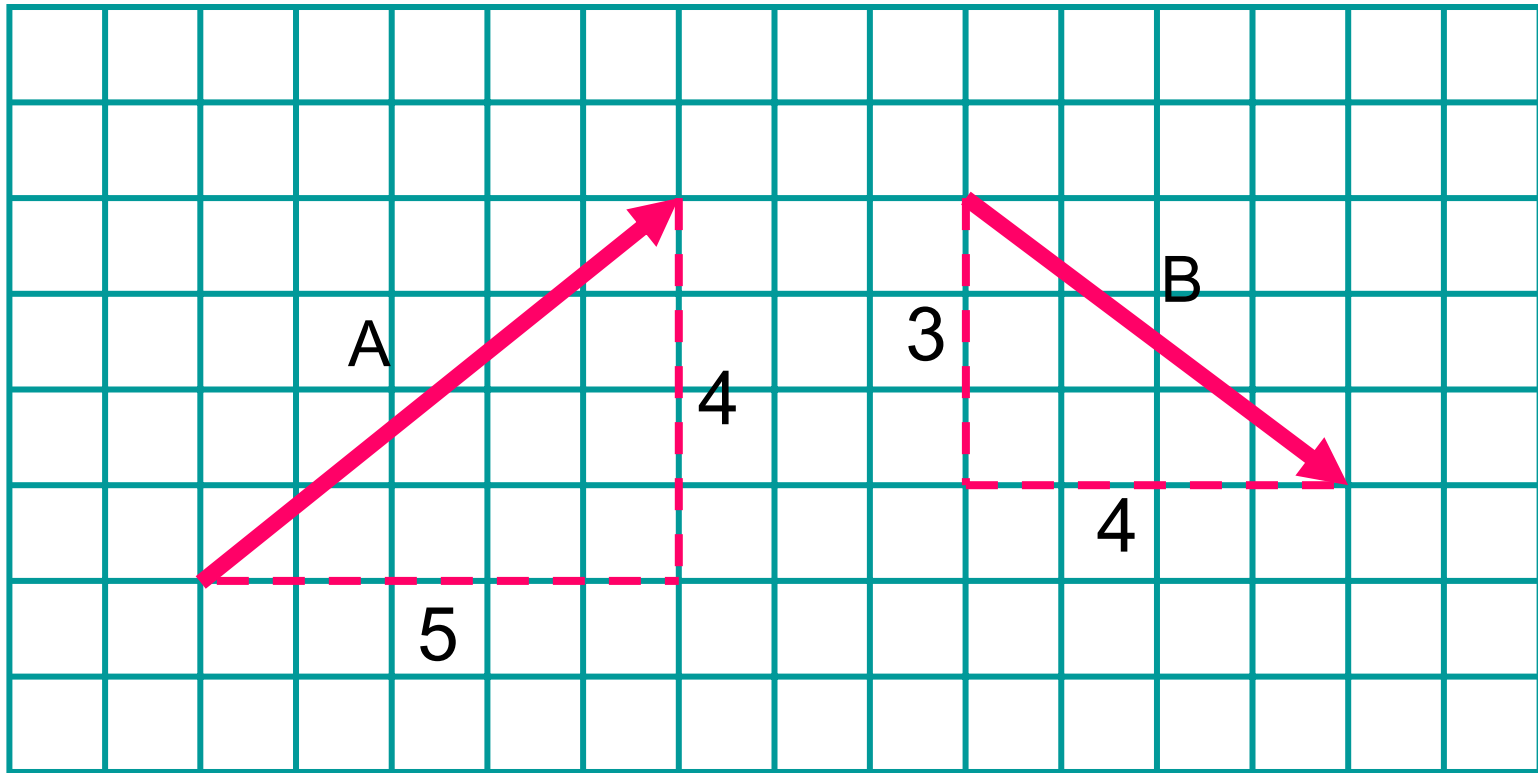

B = 10

C

A = 10

- Obviously C ≠ 10 + 10
- How do we add vectors numerically?

$\hat{i}, \hat{j}$ Notation

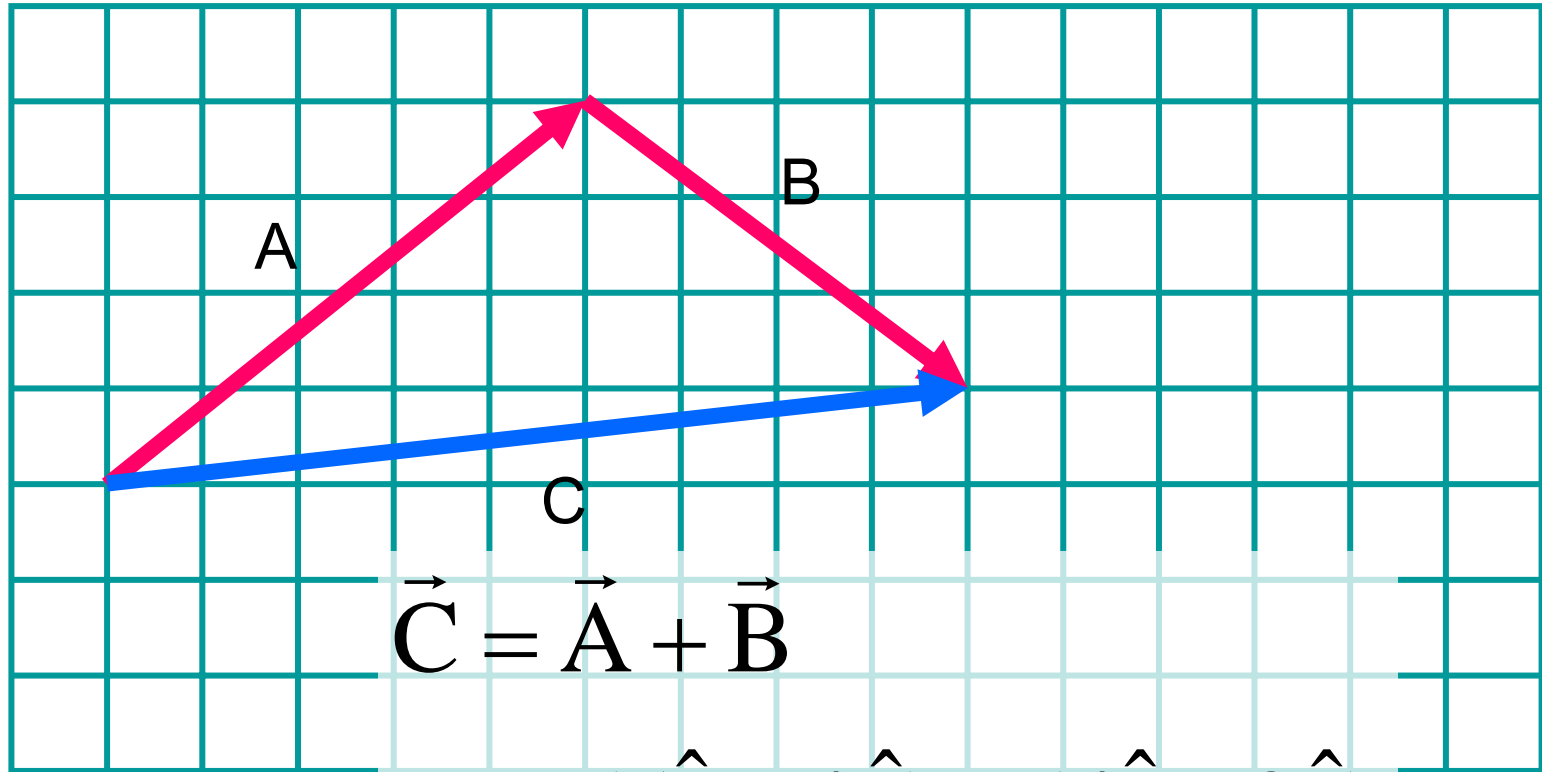$+\hat{i}$ right $(\rightarrow)$ $-\hat{i}$ left $(\leftarrow)$

$+\hat{j}$ up $(\uparrow)$ $-\hat{j}$ down $(\downarrow)$

A

4

5

B

3

4

$$\vec{A} = 5\hat{i} + 4\hat{j} \qquad \vec{B} = 4\hat{i} - 3\hat{j}$$
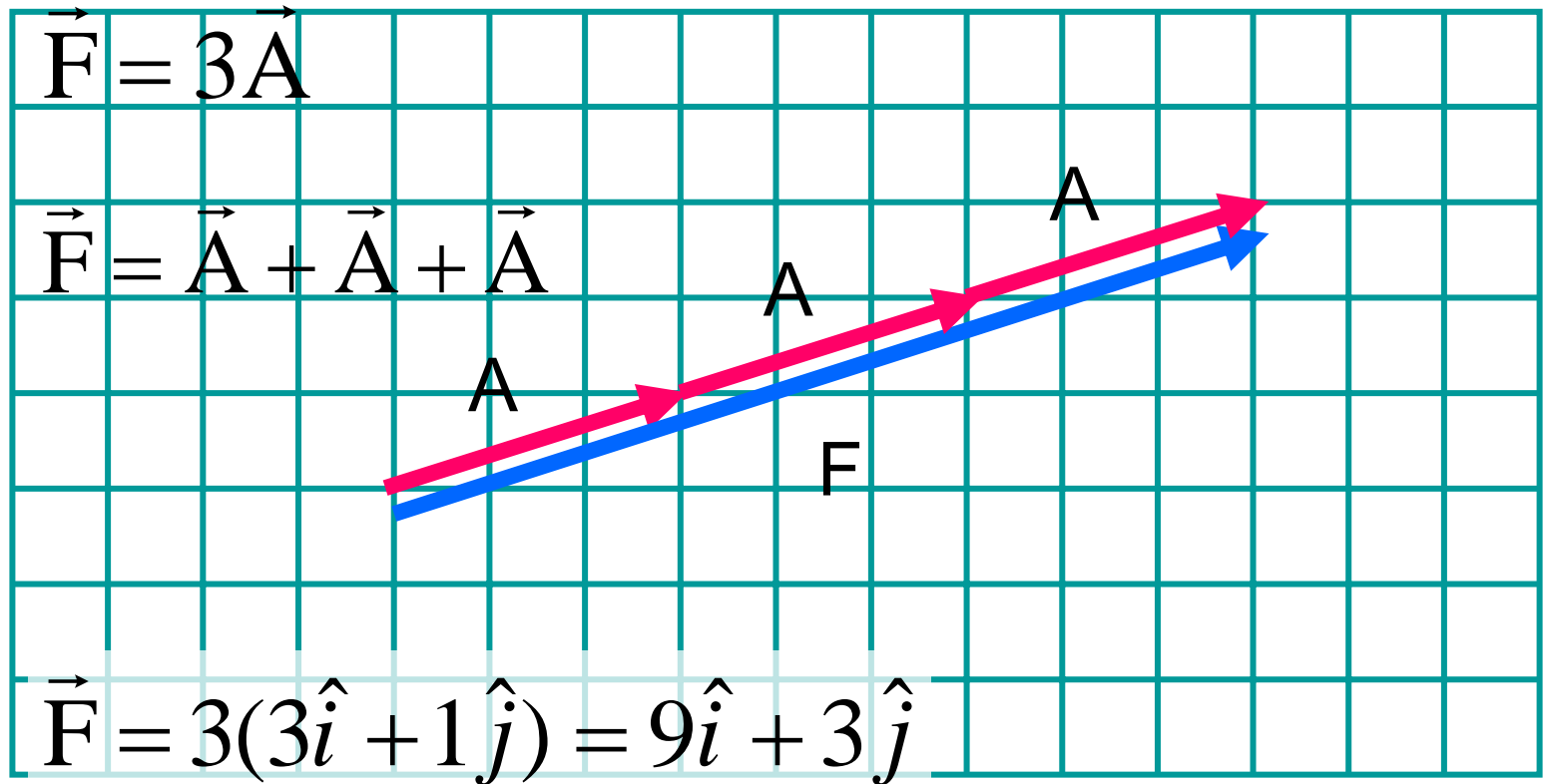
Numerical Addition of Vectors

$$\vec{C} = \vec{A} + \vec{B}$$

$$= (5\hat{i} + 4\hat{j}) + (4\hat{i} - 3\hat{j})$$

$$= 9\hat{i} + 1\hat{j}$$

Multiplication by a scalar

$$\vec{F} = 3\vec{A}$$

$$\vec{F} = \vec{A} + \vec{A} + \vec{A}$$

$$\vec{F} = 3(3\hat{i} + 1\hat{j}) = 9\hat{i} + 3\hat{j}$$

Numerical Subtraction of Vectors

$$\vec{C} = \vec{A} - \vec{B}$$

$$= (5\hat{i} + 4\hat{j}) - (4\hat{i} - 3\hat{j})$$

$$= 1\hat{i} + 7\hat{j}$$

OHQ