Complex numbers 004

Problem has been graded.

$$\frac{\mathbf{V_1}+4j}{j}-\frac{\mathbf{V_1}+4j}{cj}+\frac{\mathbf{V_1}}{-4j}+\frac{\mathbf{V_1}}{4}=0$$

Find $\mathbf{V_1}$ in cartesian coordinates, i.e., find a and b:

$$\mathbf{V_1}=a+bj$$

Solve without a calculator

Given Variables:

c : 2 .

Calculate the following:

a (.) :

-4 ✓

b (.) :

-4 ✓

Hint: Solve in cartesian coordinates.

$$\frac{\mathbf{V_1}+4j}{j}-\frac{\mathbf{V_1}+4j}{cj}+\frac{\mathbf{V_1}}{-4j}+\frac{\mathbf{V_1}}{4}=0$$

c : 2 .

Find $\mathbf{V_1}$ in cartesian coordinates, i.e., find a and b:

$\mathbf{V_1} = a + bj$

$$\frac{V_1+4j}{j}-\frac{V_1+4j}{2j}+\frac{V_1}{-4j}+\frac{V_1}{4}=0$$

$$\frac{4V_1+16j}{4j}+\frac{(-2V_1-8j)}{4j}+\frac{(-V_1)}{4j}+\frac{(V_1 j)}{4j}=0$$

$$V_1 + jV_1 + 8j = 0$$

$$V_1 = \frac{-8j}{1+j}\cdot\left(\frac{1-j}{1-j}\right)$$

$$V_1 = \frac{-8j-8}{1+1} = -4-4j$$

$\boxed{a=-4}$

$\boxed{b=-4}$