Complex numbers 005

Hint: Solve this symbolically as much as you can and only plug in numbers at the very end.

Find P and Q.

Note: We've used bold capital letters to denote complex variables. The * operator stands for complex conjugate. The Re[] and Im[] operators stand for taking the real part and imaginary part respectively.

Solve without a calculator

$$\mathbf{V_1} = be^{j\frac{\pi}{3}} \qquad \mathbf{Z_1} = a - aj \qquad \mathbf{I_1} = \frac{\mathbf{V_1}}{\mathbf{Z_1}}$$

$$\mathbf{S} = \frac{1}{2} \cdot \mathbf{V_1} \cdot \mathbf{I_1^*} \qquad P = \mathrm{Re}[\mathbf{S}] \qquad Q = \mathrm{Im}[\mathbf{S}]$$

Given Variables:

a : 1 .

b : 2 .

Calculate the following:

P (.) :

1 ✓

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Q (.) :

-1 ✓

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Hint: Work this out symbolically first and only plug in numbers later.