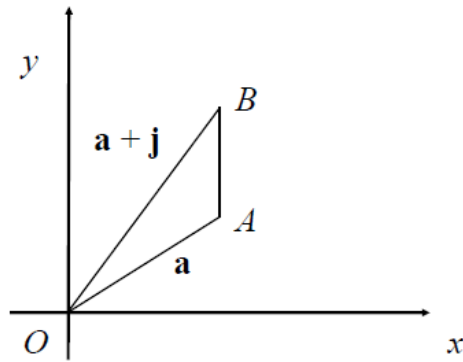


1.

Figure 1



The point A is a distance 1 unit from the fixed origin O . Its position vector is $\mathbf{a} = \frac{1}{\sqrt{2}}(\mathbf{i} + \mathbf{j})$.

The point B has position vector $\mathbf{a} + \mathbf{j}$, as shown in Figure 1.

By considering $\triangle OAB$, prove that $\tan \frac{3\pi}{8} = 1 + \sqrt{2}$.

(5)