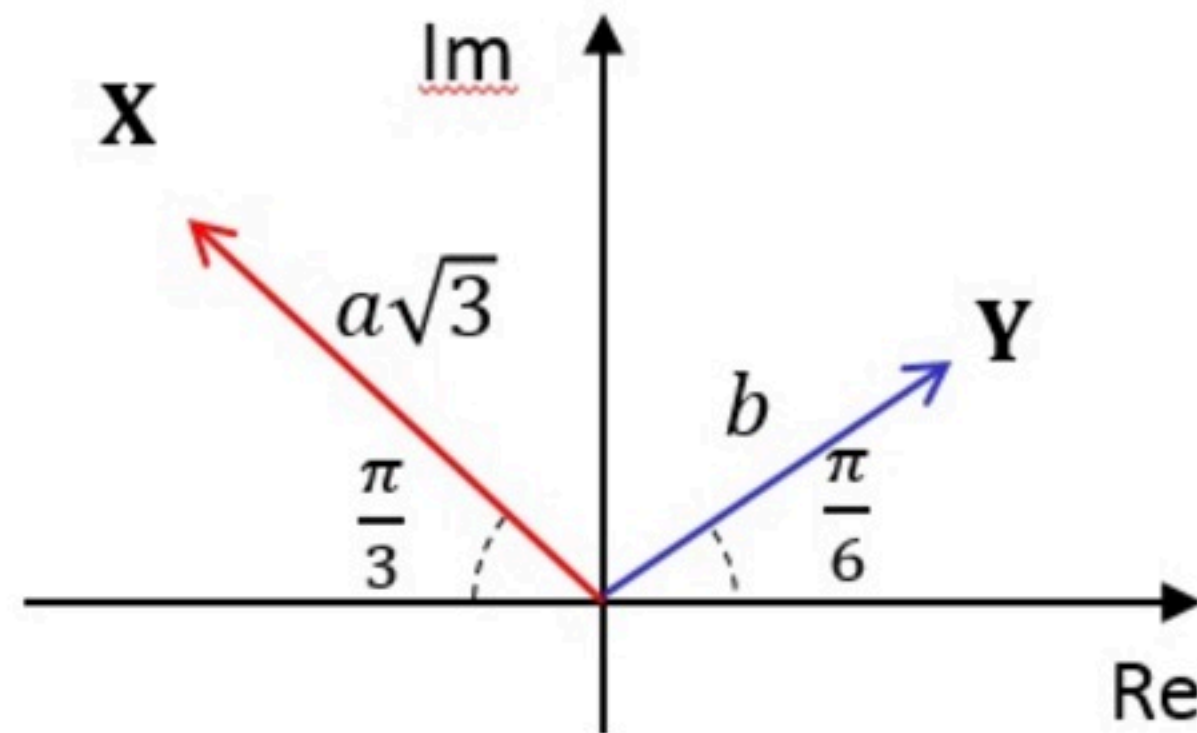


Complex numbers 003

Problem has been graded.



$$\mathbf{A} = \mathbf{X} + \mathbf{Y}$$

Find $d = |\mathbf{A}|^2$

Solve without a calculator.

Given Variables:

$a : 1$.

$b : 3$.

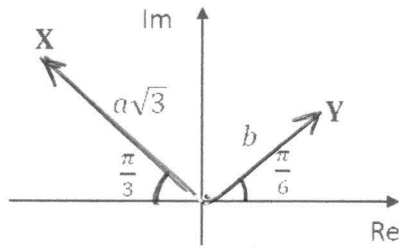
Calculate the following:

$d(.) :$

12



Hint: Convert to cartesian coordinates



a : 1.

b : 3.

$$A = X + Y$$

Find $d = |A|^2$

$$X = \sqrt{3} e^{j\frac{2\pi}{3}} = \sqrt{3} \left(-\frac{1}{2} + \frac{\sqrt{3}}{2} j \right) = -\frac{\sqrt{3}}{2} + \frac{3}{2} j$$

$$Y = 3 e^{j\frac{\pi}{6}} = 3 \left(\frac{\sqrt{3}}{2} + \frac{j}{2} \right) = \frac{3\sqrt{3}}{2} + \frac{3}{2} j$$

$$A = X + Y = \frac{2\sqrt{3}}{2} + \frac{6}{2} j = \sqrt{3} + 3j$$

$$|A|^2 = (\sqrt{3})^2 + (3)^2 = 3 + 9 = 12$$

$$d = 12$$