

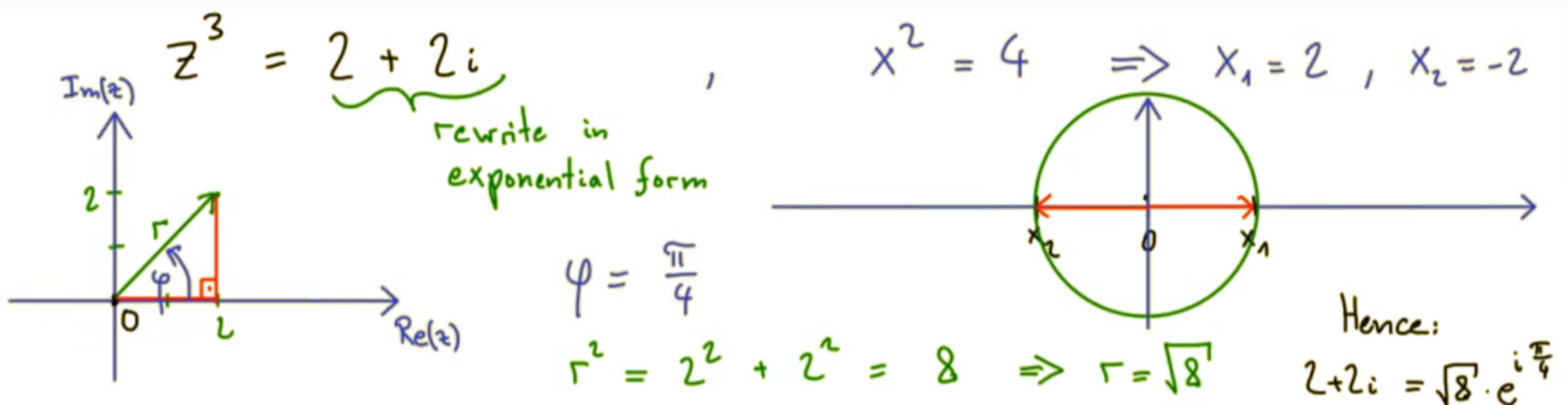
BECOME A MEMBER

ON STEADY

The Bright Side of Mathematics



Solving equations with complex numbers



Solve $z^3 = \sqrt{8} \cdot e^{i\frac{\pi}{4}}$

$\Rightarrow z^3 = \sqrt{8} \cdot e^{i(\frac{\pi}{4} + 2\pi \cdot k)}$

, $k = 0, 1, 2, \dots$

$\Rightarrow z_k = (\sqrt{8})^{\frac{1}{3}} e^{i(\frac{\pi}{4} + 2\pi k) \cdot \frac{1}{3}}$

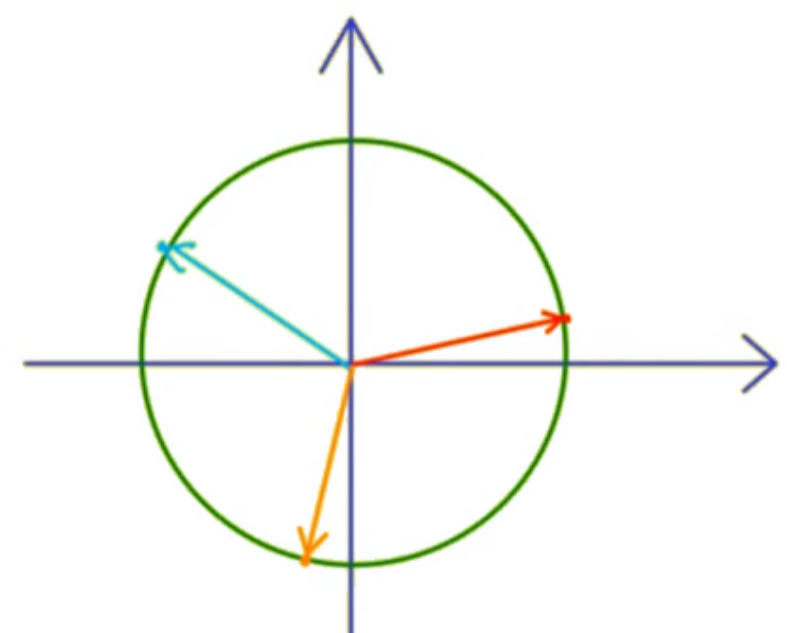
$\Rightarrow z_k = 8^{\frac{1}{6}} e^{i(\frac{\pi}{12} + \frac{2}{3}\pi \cdot k)}$

$k = 0, 1, 2$

$\Rightarrow z_0 = \sqrt{2} e^{i\frac{\pi}{12}}$

$z_1 = \sqrt{2} e^{i\frac{3}{12}\pi}$

$z_2 = \sqrt{2} e^{i\frac{17}{12}\pi}$



$z^4 = 3 + 2i$