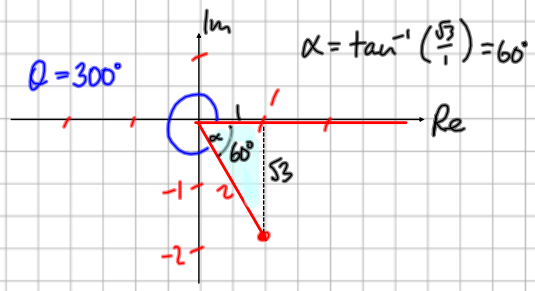
Example 3

Write the complex number $1 - i\sqrt{3}$ in modulus/argument form.

modulus: $r = \sqrt{a^2 + b^2}$

$\sqrt{3} \approx 1.7$

$r = \sqrt{1^2 + (-\sqrt{3})^2} = \sqrt{4} = 2$



POLAR FORM

$r\,\mathrm{CiS}\,\theta$

$1 - i\sqrt{3} = 2\,\mathrm{CiS}\,300°$

7. Solve the equation $z^2 - 2z + 2 = 0$ and express your answer in the form $r(\cos\theta + i\sin\theta)$.

Solve a quadratic

$z = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = 1$
$b = -2$
$c = 2$

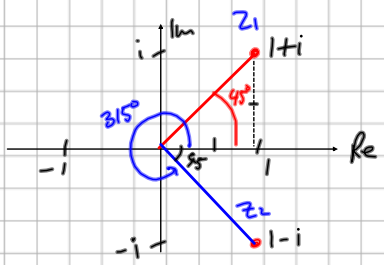
$z = \dfrac{+2 \pm \sqrt{(-2)^2 - 4(1)(2)}}{2(1)}$

$= \dfrac{+2 \pm \sqrt{-4}}{2}$

$= \dfrac{2 \pm 2i}{2} \Rightarrow \boxed{z = 1 \pm i}$

modulus $r = ?$

$r = \sqrt{a^2 + b^2}$



POLAR FORM

$r(\cos\theta + i\sin\theta)$

$r = \sqrt{1^2 + 1^2} = \sqrt{2}$

$z_1 = 1 + i = \sqrt{2}(\cos 45° + i\sin 45°)$
$z_2 = 1 - i = \sqrt{2}(\cos 315° + i\sin 315°)$