

$$z^2 + 4z + 8 = 0^2 + 4z + 8 = 0$$

$$z^2 + 2 \cdot z \cdot 2 + 2^2 = -4$$

$$(z + 2)^2 = (2i)^2$$

$$z + 2 = \pm 2i$$

$$z = -2 \pm 2iz_1 = 2 - 2iz_2 = 2 + 2i$$