

Example A-5: Solve $z^7 = 1$, using the procedure above.

$$r^7 e^{j7\theta} = e^{j2\pi\ell}$$

$$\implies r = 1$$

$$\implies 7\theta = 2\pi\ell$$

$$\theta = \frac{2\pi}{7}\ell \quad \ell = 0, 1, 2, 3, 4, 5, 6$$

Therefore, these solutions are equally spaced around the unit circle, as shown in Fig. ???. In this case, the solutions are called the **7th roots of unity**.

