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

$$\implies r = 1$$

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

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

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

Therefore, these solutions are equally spaced around the unit circle, as shown in Fig.  $\ref{fig:prop}$ . In this case, the solutions are called the  $\ref{fig:prop}$  roots of unity.

McClellan, Schafer, and Yoder, *DSP First*, *2e*, ISBN 0-13-065562-7. Prentice Hall, Upper Saddle River, NJ 07458. ©2016 Pearson Education, Inc.

