

Panel 1

Define $\omega_k = e^{i \frac{2\pi k}{n}}$ for $k = 0, 1, 2, \dots, n-1$.

① Show that $(\omega_k)^n = 1$ for $k = 0, 1, 2, \dots, n-1$, i.e.
the ω_k are the n -th roots of unity

② Show that $(\omega_1)^j = \omega_j$ for $j = 0, 1, \dots, n-1$

③ Illustrate ① and ② for the sixth-roots of unity in terms of a picture