

Example 6 Let z_1 and z_2 be two complex numbers such that $\bar{z}_1 + i\bar{z}_2 = 0$ and $\arg(z_1 z_2) = \pi$. Then find $\arg(z_1)$.

Example 11 Find the value of $2x^4 + 5x^3 + 7x^2 - x + 41$, when $x = -2 - \sqrt{3}i$

Example 24 What is the principal value of amplitude of $1 - i$?



Example 25 What is the polar form of the complex number $(i^{25})^3$?

6. If $a = \cos \theta + i \sin \theta$, find the value of $\frac{1+a}{1-a}$.
7. If $(1 + i) z = (1 - i) \bar{z}$, then show that $z = -i \bar{z}$.
8. If $z = x + iy$, then show that $z \bar{z} + 2(z + \bar{z}) + b = 0$, where $b \in \mathbf{R}$, represents a circle.
9. If the real part of $\frac{\bar{z} + 2}{\bar{z} - 1}$ is 4, then show that the locus of the point representing z in the complex plane is a circle.
10. Show that the complex number z , satisfying the condition $\arg \left(\frac{z-1}{z+1} \right) = \frac{\pi}{4}$ lies on a circle.
11. Solve the equation $|z| = z + 1 + 2i$.