1. Determine if the statement is True or False and give a (short) supporting reason.

   (a) $\{z : 1 < |z| \leq 2\}$ is open.

   (b) $\{z : |z - i| = 1\}$ is a circle of radius 1 centered at $-i$.

   (c) If $w_1, w_2 \in \mathbb{C}$ and z_1 is a root of the polynomial $p(z) = z^2 + w_1 z + w_2$, then $\overline{z}_1$ is also a root of $p(z)$.

   (d) $(1 + i)^{10} = 32i$

   (e) $\{z : |z + i| \geq |z - i|\} = \{z : \Im z \geq 0\}$

   (f) $\operatorname{Arg}(z_1 z_2) = \operatorname{Arg} z_1 + \operatorname{Arg} z_2 + n2\pi$ for n either -1, 0 or 1.

   (g) $1/z = \overline{z}/|z|^2$

   (h) $z^2 - \overline{z}^2 = 1$ is the equation of a hyperbola

   (i) $i^{55} = -i$

   (j) $\lim_{z \to -\infty} 1/z = 0$