$$(x-i)^{36} + (x+i)^{36} = 0$$

$$(x-i)^{36} = -(x+i)^{36}$$

$$x \neq i$$

$$\left(\frac{x-i}{x+i}\right)^{36} = -1$$

$$A = \frac{x-i}{x+i}$$

$$A^{36} = -1$$

$$z = -1 = -1 + 0i$$

$$|z| = \sqrt{1} = 1$$

$$\cos \varphi = \frac{-1}{1} = -1, \sin \varphi = \frac{0}{1} = 0 \implies \varphi = \pi$$

$$z = \cos \pi + i \sin \pi$$

$${}^{36}\sqrt{z} = \cos \frac{\pi + 2k\pi}{36} + i \sin \frac{\pi + 2k\pi}{36} = z_k$$

$$k = 0, 1, \dots, 35$$

$$\frac{x-i}{x+i} = z_k$$

$$x - i = z_k(x+i)$$

$$x - i = z_k(x+i)$$

$$x - i = z_kx + z_ki$$

$$i - z_ki = z_kx + x$$

$$(1 - z_k)i = (z_k + 1)x$$

$$z_k < \cos \frac{\pi + 2\pi 36}{36} + i \sin \frac{\pi + 2\pi 36}{36} = \cos \pi + i \sin \pi = -1$$

$$\implies z_k + 1 \neq 0$$

$$x = \frac{(z_k - 1)i}{(z_k + 1)}$$