cube root of

$1+i$

$z = x+iy = 1+i$

$\cancel{\alpha} = \tan^{-1}\left|\frac{y}{x}\right| = \tan^{-1}\left|\frac{1}{1}\right| = \pi/4$

$r = \sqrt{x^2+y^2} = \sqrt{1+1} = \sqrt{2}$

$\because z = 1+i = (+,+)$ it in 1st quadrant

$\theta = \pi = \pi/4$

$z = \sqrt{2}\left[\cos\left[\pi/4\right] + i\sin\left[\pi/4\right]\right]$

or $z = \sqrt{2}\left[\cos\left(2k\pi + \frac{\pi}{4}\right) + i\sin\left(2k\pi + \pi/4\right)\right]$

$z = 2^{1/2}\left[\cos\left(\frac{8k+1}{4}\right)\pi + i\sin\left(\frac{8k+1}{4}\right)\pi\right]$

$z^{1/3} = 2^{1/6}\left[\cos\left(\frac{8k+1}{4}\right)\pi + i\sin\left(\frac{8k+1}{4}\right)\pi\right]^{1/3}$

z_k. $z^{1/3} = 2^{1/6}\left[\cos\left(\frac{8k+1}{12}\right)\pi + i\sin\left(\frac{8k+1}{12}\right)\pi\right]$ 0, 1, 2.

$z_0 = 2^{1/6}\left(\cos\left(\frac{\pi}{12}\right) + i\sin\left(\frac{\pi}{12}\right)\right)$

$z_1 = 2^{1/6}\left(\cos\left[\frac{9\pi}{12}\right] + i\sin\left(\frac{9\pi}{12}\right)\right)$

$z_2 = 2^{1/6}\left[\cos\left(\frac{17\pi}{12}\right) + i\left(\frac{17\pi}{12}\right)\right]$