

3.77  
כ8

3.57 ד' ארבעה נקודות, ארבעה נקודות

II

$$z^4 = -1 - (i \frac{\sqrt{3}}{3} - i \sin \frac{4\pi}{3})$$

$$z^4 = -1 - (i \frac{\sqrt{3}}{3} - i \sin(-\frac{\pi}{3})) = -1 - cis(\frac{\pi}{3})$$

$$r^2 = (1 + \cos(\frac{\pi}{3}))^2 + \sin^2(\frac{\pi}{3}) = 1 + 2(\frac{1}{2}) + \cos^2(\frac{\pi}{3}) + \sin^2(\frac{\pi}{3})$$

$$= 2 + 2\cos(\frac{\pi}{3}) = 3$$

$$r = \sqrt{3}$$

$$\tan \theta = \frac{-\sin(\frac{\pi}{3})}{-1 - \cos(\frac{\pi}{3})} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{3}{2}} = \frac{1}{\sqrt{3}} \rightarrow \theta = \text{כ} 210$$

$$z^4 = \sqrt{3} cis(210) = \sqrt{3} cis(\frac{7\pi}{6})$$

$$z_k = \sqrt[4]{3} cis(\frac{7\pi}{24} + \frac{k\pi}{2}) \quad k=0,1,2,3$$

3.77  
כ9

I

$$1 \leq |z+1-i| \leq 4 \rightarrow 1 \leq (x+1)^2 + (y-1)^2 \leq 16$$

$$|z-i| < |z+1| \rightarrow (x)^2 + (y-1)^2 < (x+1)^2 + y^2$$

$$-2y+1 < 2x+1 \rightarrow -x < y$$

$$\operatorname{Re}(z) < 0 \rightarrow x < 0$$



II

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