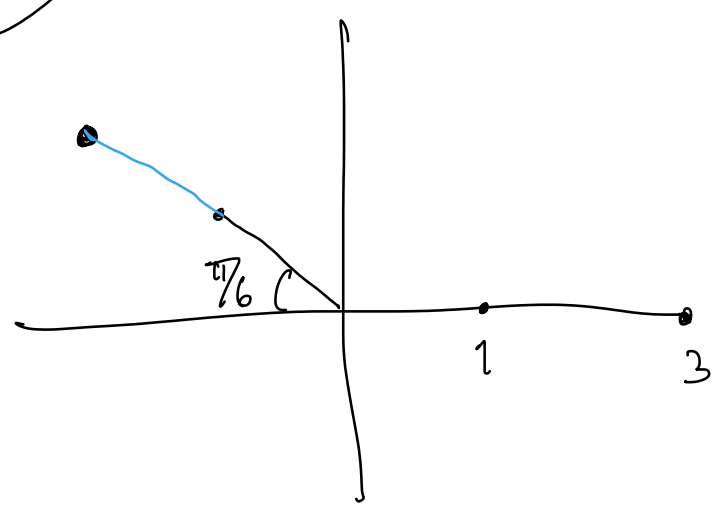
# 6.32

måndag 19 december 2022 14:27

a)




$|z| = 1$

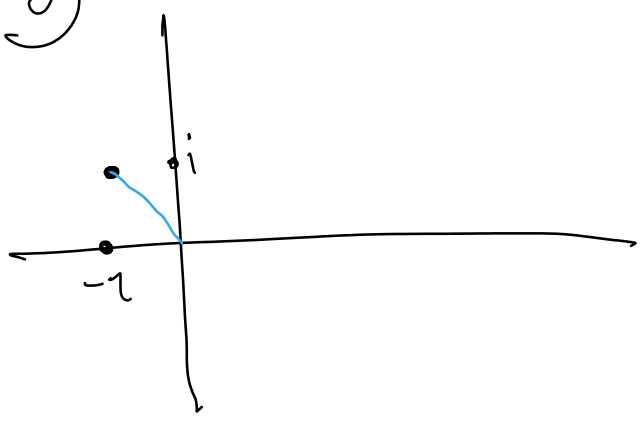
$\arg z = 5\pi/6$

$z = e^{i\,5\pi/6}$

$3z = 3e^{i\,5\pi/6} = 3\left(\cos 5\pi/6 + i \sin 5\pi/6\right) = 3\left(-\frac{\sqrt{3}}{2} + i\frac{1}{2}\right) =$

$= -\frac{3\sqrt{3}}{2} + i\frac{3}{2}$

b)




$|z_0| = \sqrt{2} \qquad |z_1| = 3\sqrt{2}$

$\arg z_0 = 3\pi/4$

$z_0 = \sqrt{2}\, e^{i\,3\pi/4}$

$\arg z_1 = \frac{3\pi}{4} + \frac{5\pi}{6} =$

$z_1 = 3e^{i\,3\pi/4} \cdot \sqrt{2}\, e^{i\,5\pi/6} =$

$= 3\sqrt{2}\left(\cos\frac{3\pi}{4} + i \sin\frac{3\pi}{4}\right)\left(\cos\frac{5\pi}{6} + i \sin\frac{5\pi}{6}\right) =$

$= 3\sqrt{2}\left(-\frac{1}{\sqrt{2}} + i\frac{1}{\sqrt{2}}\right)\left(-\frac{\sqrt{3}}{2} + i\frac{1}{2}\right) =$

$= 3(-1+i)\left(-\frac{\sqrt{3}}{2} + i\frac{1}{2}\right) =$

$= 3\left(\frac{\sqrt{3}}{2} - \frac{1}{2} - \frac{\sqrt{3}}{2}i - \frac{1}{2}i\right) =$

$= \frac{3}{2}\left(\sqrt{3} - 1\right) - \frac{3}{2}i\left(\sqrt{3} + 1\right)$