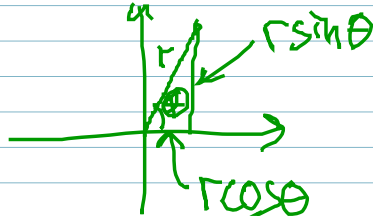
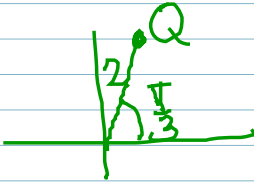


Polære koordinater

$P(r, \theta)_{\text{pol}} = (-r, \theta + \pi)_{\text{pol}}$
 $(r, \theta + 2\pi)_{\text{pol}}$

$$x = r \cos \theta, y = r \sin \theta$$

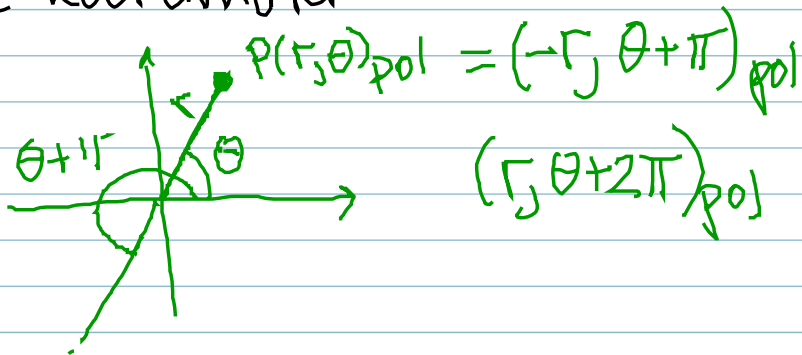


$(2, \frac{\pi}{3})$ pol

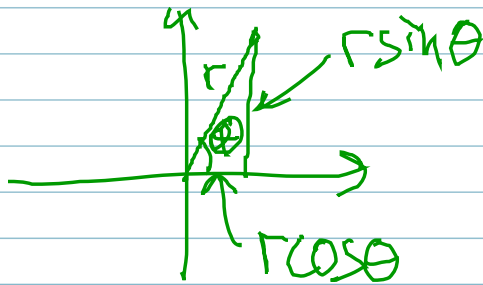
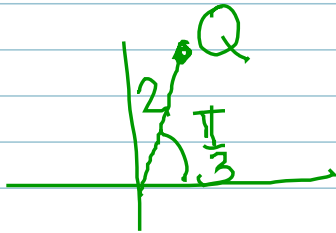
$$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2} \quad \sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

$$\vec{Q} = (2 \cdot \cos(\frac{\pi}{3}), 2 \sin(\frac{\pi}{3})) = (1, \sqrt{3})$$

Polære koordinater



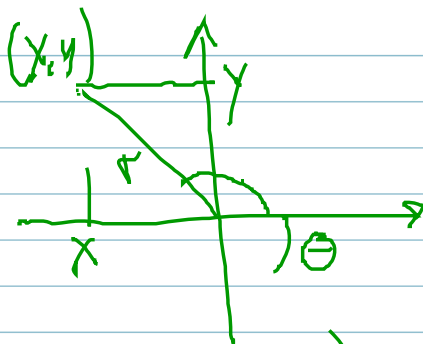
$$x = r \cos \theta, \quad y = r \sin \theta$$



$$(2, \frac{\pi}{3})_{pol}$$

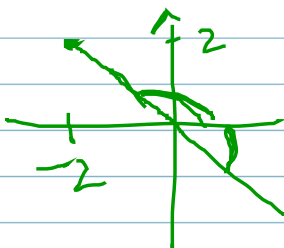
$$\cos(\frac{\pi}{3}) = \frac{1}{2} \quad \sin(\frac{\pi}{3}) = \frac{\sqrt{3}}{2}$$

$$Q \quad (2 \cdot \cos(\frac{\pi}{3}), 2 \sin(\frac{\pi}{3})) = (1, \sqrt{3})$$



$$r^2 = x^2 + y^2 \quad \tan \theta = \frac{y}{x}$$

$$r = \pm \sqrt{x^2 + y^2} \quad \theta = \begin{cases} \tan^{-1}\left(\frac{y}{x}\right) \\ \tan^{-1}\left(\frac{y}{x}\right) + \pi \end{cases}$$



$$r^2 = 2^2 + 2^2 = 8$$

$$\theta = \tan^{-1}\left(\frac{2}{-2}\right) = -\frac{\pi}{4}$$

$$\left\{ -\frac{\pi}{4} + \pi = \frac{3\pi}{4} \right.$$

$$(2\sqrt{2}, \frac{3\pi}{4})_{pol}$$

$$(-2\sqrt{2}, -\frac{\pi}{4})_{pol}$$