⑤ $\frac{1}{2}\int_0^{2\pi} f(\theta)^2 \, d\theta$

$= \frac{1}{2}\int_0^{2\pi} (3 - 2\cos\theta)^2 \, d\theta$ $= \frac{1}{2}(30 + 2\sin\theta)\Big|_0^{2\pi}$

$= \frac{1}{2}(6\pi - 0) = 3\pi$

$= \frac{1}{2}\int_0^{2\pi} 4\cos^2\theta - 12\cos\theta + 9$

$= \frac{1}{2}\left(\text{Atom}\ \sin 2\theta + 2\theta - 12\sin\theta + 9\theta\right)\Big|_0^{2\pi}$

$= \frac{1}{2}(22\pi - 0) = 11\pi$

(3) (a) terhadap polar axis

$r = 3\cos(4\theta) \equiv r = 3\cos(-4\theta)$

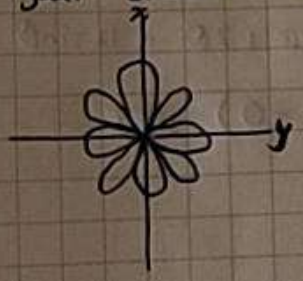
simetri thd polar axis

vertical axis

persamaan rose $r = a\cos 6\theta$

adalah rose dengan 8 petal karena $n \neq 3$

jadi simetri ke semua sumbu dan titik pole



(4) (a) saat $\theta = 0$, $r = 0$

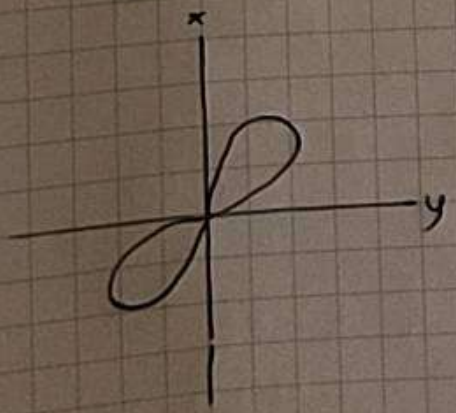
saat $\theta = \frac{\pi}{4}$, $r = \pm 4$

saat $\theta = \frac{\pi}{2}$, $r = 0$

saat $\theta < \frac{3\pi}{4}$, r undefined

$r^2 = 16 \sin 2\theta$

Saat $\theta < \pi$, $r = 0$



(2) conic $= \dfrac{ep}{1 \pm e\cos\theta}$

(a) $\dfrac{2}{2+\sin\theta} = \dfrac{2}{2\left(1+\frac{\sin\theta}{2}\right)} = \dfrac{1}{1+\frac{\sin\theta}{2}}$

$e = \frac{1}{2}$ maka kurva elips

saat $\theta = 0$, $r = 1$

$\theta = \frac{\pi}{6}$, $r = \frac{4}{5}$

$\theta = \frac{\pi}{2}$, $r = \frac{2}{3}$

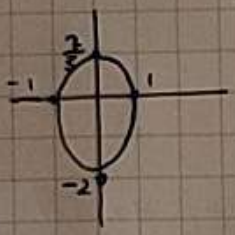
$-1-\frac{\sqrt{5}}{3}$ $\quad 1+\frac{\sqrt{5}}{3}$ $\quad \frac{2}{3}$

$a = 1$, $b = \frac{2}{3}$, $c = \sqrt{a^2-b^2} = \sqrt{1-\frac{4}{9}} = \frac{\sqrt{5}}{3}$

Saat $\theta = 0$, $r = 1$

$\theta = \frac{\pi}{2}$, $r = \frac{2}{3}$

$\theta = \frac{3\pi}{2}$, $r = 2$



major radius $= \frac{8}{5}$

focus $= (0, \pm ae)$

$e = \frac{1}{2}$, $\frac{a^2}{3} = 4 \rightarrow a = \frac{2}{\sqrt{3}}$

focus $= \left(0, \pm\left(\frac{2}{3}\right)\right)$ dan $\left(0, -\frac{6}{3}\right)$

directrix $= \pm\frac{a}{e} = \pm\frac{1}{\frac{1}{2}}ae$

$y = \frac{2}{3} + \frac{1}{\sqrt{3}}$

$y = -\frac{6}{3} - \frac{1}{3}$

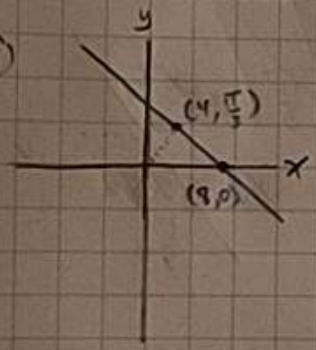
ALDEVLWTHE I
2206028932

(i) (a) $\frac{x}{2} + \frac{\sqrt{3}y}{2} - 4 = 0$

$\Rightarrow x + \sqrt{3}y = 8$

$\Rightarrow y = \frac{8}{\sqrt{3}} - \frac{x}{\sqrt{3}}$, gradien $-\frac{1}{\sqrt{3}}$, geser kanan $\frac{8}{\sqrt{3}}$ unit

(ii)



(iii) $x = r\cos\theta$
$y = r\sin\theta$

$\Rightarrow r\sin\theta = \frac{8}{\sqrt{3}} - \frac{r\cos\theta}{\sqrt{3}}$

$\Rightarrow r(\sin\theta + \frac{\cos\theta}{\sqrt{3}}) = \frac{8}{\sqrt{3}}$

$\Rightarrow r = \frac{8\cos\theta}{3} + \frac{8}{\sqrt{3}} \cdot \frac{1}{(\sin\theta + \frac{\cos\theta}{\sqrt{3}})} = \frac{8}{\sqrt{3}\sin\theta + \cos\theta}$

(iv) jarak garis $ax + by + c = 0$ ke titik (x_1, y_1)
$= |ax_1 + by_1 + c| \cdot \frac{1}{\sqrt{a^2+b^2}}$

$\Rightarrow \frac{1}{\sqrt{3}}x + y - \frac{8}{\sqrt{3}} = 0 \Rightarrow \frac{|-\frac{8}{\sqrt{3}}|}{\sqrt{\frac{4}{3}}} = \frac{\frac{8}{\sqrt{3}}}{\frac{2}{\sqrt{3}}} = 4$

titik (0,0)