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Pop Quiz 6

1. $a = 2$

$$\int_0^{2\pi} y\,dx$$

$x = 2t - 2\sin t \Rightarrow dx = 2 - 2\cos t\,dt$

$y = 2 - 2\cos t$

Batas:

$2\pi = 2t - 2\sin t$ saat $t = \pi$ $\quad 2\pi = 2\pi$

$0 = 2t - 2\sin t$ saat $t = 0$

yang integral

$$\int_0^{2\pi} 2 - 2\cos t\,(2 - 2\cos t)\,dt = \int_0^{2\pi} (2 - 2\cos t)^2\,dt$$

$$= \int_0^{2\pi} 4 - 8\cos t + 4\cos^2 t\,dt$$

$$= \int_0^{2\pi} 4 - 8\cos t + 2\left(\frac{\cos 2t + 1}{2}\right)\,dt$$

$$= \int_0^{2\pi} 5t - 8\sin t + \sin 2t \,\Big|_0^{2\pi}$$

$$= 5t - 8\sin t + \sin 2t \,\Big|_0^{2\pi}$$

$$= (5\cdot 2\pi - 0 + 0) - (0 - 0 + 0) = 5\pi$$

2] a.) $A(-3\sqrt{3}, -5)$, $B(6, 4)$

$$r = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

$$= \sqrt{(4 + 5)^2 + (0 + 5\sqrt{3})^2}$$

$$= \sqrt{81 + 75} = \sqrt{156} = 2\sqrt{39}$$

$$\tan\theta = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9}{3\sqrt{3}} = \frac{3\sqrt{3}}{5}$$

$$\theta = \arctan\left(\frac{3\sqrt{3}}{5}\right) \quad 0 < \theta < \frac{\pi}{2}$$

+ titik:

- $\left(2\sqrt{39}, \arctan\left(\frac{3\sqrt{3}}{5}\right)\right)$
- $\left(2\sqrt{39}, \arctan\left(\frac{3\sqrt{3}}{5}\right) + \pi\right)$
- $\left(2\sqrt{39}, \arctan\left(\frac{3\sqrt{3}}{5}\right) - \pi\right)$
- $\left(-2\sqrt{39}, -\arctan\left(\frac{3\sqrt{3}}{5}\right)\right)$

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3] a.) $x+y=8$ polar?

$r\sin\theta + r\cos\theta = 8$

$r(\sin\theta + \cos\theta) = 8$

$r = \dfrac{8}{\sin\theta + \cos\theta}$

~~$\dfrac{8}{\sin\theta + \sin(\frac{\pi}{2}-\theta)}$~~

↑] b.) tent e, pos. directrix, sketch

$r = \dfrac{6}{2+2\sin(\theta-\frac{\pi}{3})}$

$= \dfrac{3}{1+\sin(\theta-\frac{\pi}{3})}$

$e=1 \Rightarrow$ parabola

$ed = 3$

$d = 3$

let $\theta - \frac{\pi}{3} > t$

$r + r\sin t = 6$

$r + y = 6$

$r = 6-y$

$r^2 = 36 - 12y + y^2$

$x^2 + y^2 = 36 - 12y + y^2$

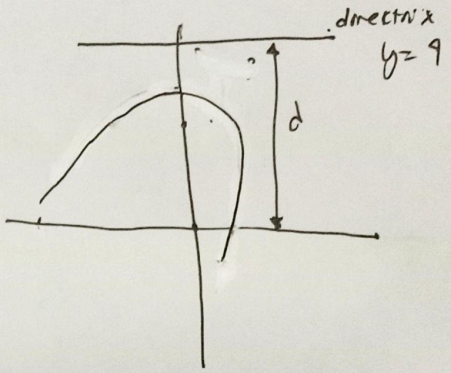
$x^2 = 36 - 12y$

$x^2 = 12(3-y)$

$x^2 = -4(3)(y-3)$

pusat $(0,3)$ rotasi $\frac{\pi}{3}$

$r = \dfrac{ed}{1+e\sin\theta}$



directrix $y = 4$

5.] b.) Simetri $r = 20\cos 3\theta$

Sim x-axis

$(r,\theta) \to (r,-\theta)$

$r = 20\cos(-3\theta)$

$= 20\cos 3\theta$ ekivalen //

simetri sumbu x //

$(r,\theta) \to (-r,-\theta)$

$-r = 20\cos(-3\theta)$

$-r = -20\cos(+3\theta)$

$= -20\cos 3\theta$ ✗

Tidak simetri sumbu y

$(r,\theta) \to (-r,\theta)$

$-r = 20\cos(3\theta)$

$r = -20\cos 3\theta$

Tidak simetri origin / polar