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1 a.) $4x^2 + y^2 = 36$ $(:3)$

$$\frac{x^2}{9} + \frac{y^2}{36} = 1 \quad \Rightarrow \quad \boxed{\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1}$$

persamaan elips

$$\frac{x^2}{3^2} + \frac{y^2}{6^2} = 1$$

$\boxed{b = 3}$ $\boxed{a = 6}$ $\Rightarrow$ a selalu $> b$

$\Rightarrow$ cari c nya

$$c^2 = a^2 - b^2$$
$$= 6^2 - 3^2 = 36 - 9 = 27$$
$$c = \pm\sqrt{27} = \pm 3\sqrt{3}$$

•) cari titik potong

$x = 0$:
$$0 + \frac{y^2}{36} = 1 \iff y = \pm 6$$

$y = 0$:
$$\frac{x^2}{9} + 0 = 1 \iff x = \pm 3$$

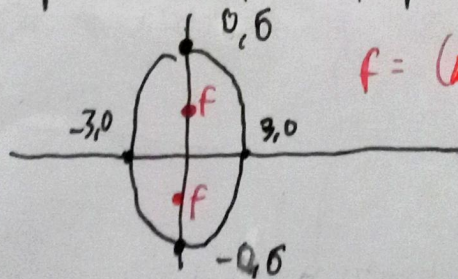•) since $|y| > |x|$, maka ellips vertikal, which focus berada di sumbu y

∴ - fokus $(0, 3\sqrt{3})$ dan $(0, -3\sqrt{3})$

- verteks $(0,6)$ dan $(0, -6)$

- direktrix $y = 6 + 3\sqrt{3}$
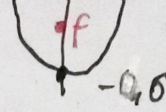   dan $y = -6 - 3\sqrt{3}$

$f = (0, \pm 3\sqrt{3})$

$4x^2 + y^2 = 36$

2)

$e = 2$; $y^2 = -8x$ ditanya pers. hiperbola dgn pusat $(0,0)$, f, vertex, direktris

dibawa ke $y^2 = 4px$ | asimtot : $y = \pm \frac{b}{a} x$

- direktrix $y = 6 + 3\sqrt{3}$
  dan $y = -6 - 3\sqrt{3}$

$4x^2 + y^2 = 36$

$\bullet f$
-0.6

2)

$e = 2$; $y^2 = -8x$ ditanya ~~direktrix~~ pers. hiperbola dgn pusa $(0,0)$, f, vertex, direktrix

$y^2 = -8x$ dibawa ke $y^2 = 4px$ asimtot : $y = \pm \dfrac{b}{a} x$

$y^2 = 4(-2)x$ $= \pm \dfrac{\sqrt{3}}{1} x = \pm\sqrt{3}x$

$\boxed{p = -2}$ direktrix $= x = -(-2)$

                        $x = 2$

~~titik puncak~~ :
~~titik potong~~ : karena directrix garis $x = C$
persamaan : ~~direk~~ maka hyperbola horizontal

$\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1 \;(=)\; \dfrac{x^2}{1^2} - \dfrac{y^2}{3} = 1$

→ Diket $e = 2$

$e = \dfrac{c}{a}$

$2 = \dfrac{c}{a}$

titik puncak di ~~(zero~~ $(\pm a, 0) = (\pm 1, 0)$

$2a = c$

karna direk trics sama :
berlaku $c = P$; $c = -2$

$2a = -2$

$a = -1$

Diket $c^2 = a^2 + b^2$

$(-2)^2 = (-1)^2 + b^2$

$b = \sqrt{4 - 1} = \sqrt{3}$
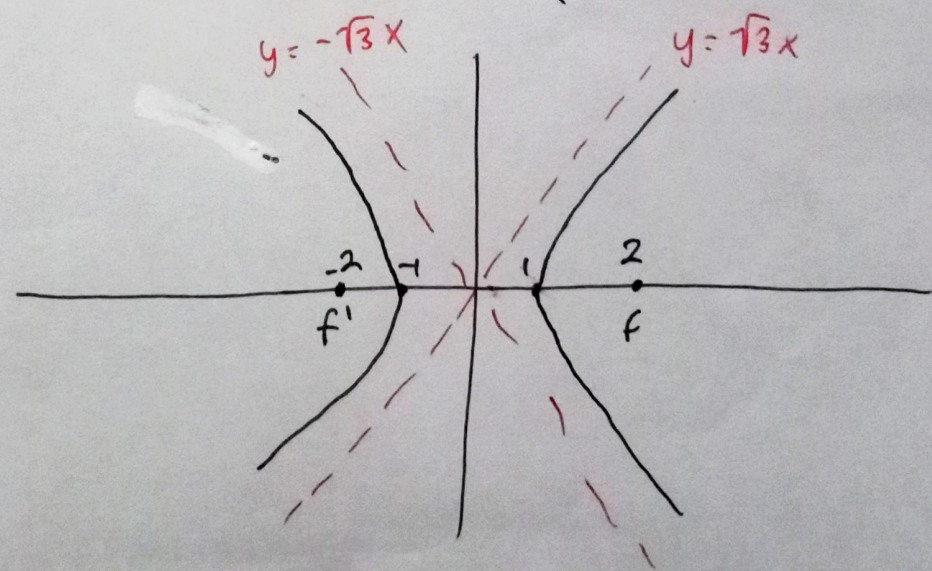
$y = -\sqrt{3}x$ $y = \sqrt{3}x$

-2 -1 1 2
f' f

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3 b.) $4x^2 - 16x + 2y^2 + 16y + 90 = 0$

$4(x^2 - 4x) + 2(y^2 + 8y) = -90$

$4(x^2 - 4x + 4) + 2(y^2 + 8y + 16) = -90 + 16 + 32$

$4(x-2)^2 + 2(y+4)^2 = -18$

$2(x-2)^2 + (y+4)^2 = -9$

Anggap $\boxed{u = x-2 \; ; \; v = y+4}$

$2u^2 + v^2 = 9 \quad (:9)$

$\dfrac{u^2}{2} + \dfrac{v^2}{9} = 1$

$\dfrac{u^2}{(\sqrt{2})^2} + \dfrac{v^2}{2^2} = 1 \Rightarrow \boxed{\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1}$ ellipse
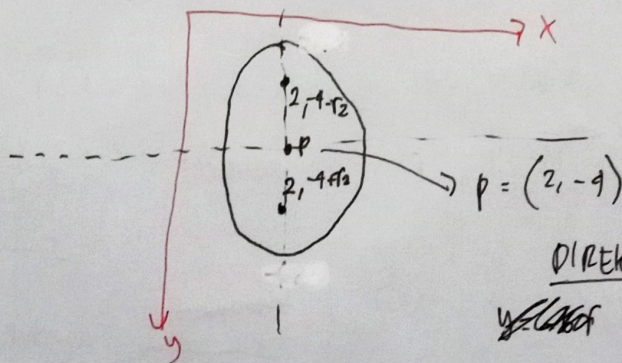
$a > b \Rightarrow a = 2 \quad b = \sqrt{2}$

Penyebut a ada di y (atau v)
maka ellipse horizontal; directrix $y = $

$f = (Tx, Ty \pm c)$

$= (2, -4 \pm \sqrt{2})$

$f(2, -4 - \sqrt{2})$
$V f(2, -4 + \sqrt{2})$
TITIK FOKUS

$c^2 = a^2 - b^2 \iff c = \sqrt{4-2} = \sqrt{2}$

$\boxed{e = \dfrac{c}{a} = \dfrac{\sqrt{2}}{\sqrt{2}} = 1}$ EKSENTRISITAS

Tipot : $2u^2 + v^2 = 4$
Saat u=0 : $\quad v^2 = 4 \iff v = \pm 2$

$y + 4 = \pm 2$
$y = \pm 2 - 4$
$y_1 = -6 \; V \; y_2 = -2$

Saat v=0 : $2u^2 = 9$
$u = \pm\sqrt{2}$
$x - 2 = \pm\sqrt{2}$

$x = 2 + \sqrt{2} \; V \; x = 2 - \sqrt{2}$

berdasarkan ini $Tx = 2 ; Ty = -4$

directrix :

directrix : $y_1' = -y_1 - c \quad \boxed{y_2 > y_1}$
$V \; y_2' = y_2 + c$

$y = -6 - \sqrt{2} \; V \; y = -2 + \sqrt{2}$

TITIK PUNCAK
$(Tx, y_1) \; V \; (Tx, y_2)$
$(2, -6) \; V \; (2, -2)$

$p = (2, -4)$

DIREKTRIX

9 b.) $y^2 = x$, rotasi $\frac{\pi}{6}$

$x = u \cos \theta - v \sin \theta$

$\quad = u \cos \frac{\pi}{6} - v \sin \frac{\pi}{6}$

$\quad = u \cdot \frac{1}{2}\sqrt{3} - v \cdot \frac{1}{2}$

$y = u \sin \theta + v \cos \theta$

$\quad = u \sin \frac{\pi}{6} + v \cos \frac{\pi}{6}$

$\quad = u \cdot \frac{1}{2} + v \frac{1}{2}\sqrt{3}$

$\Leftrightarrow$ $\left(\frac{u}{2} + \frac{v\sqrt{3}}{2} \right)^2 = \frac{u\sqrt{3}}{2} - \frac{v}{2}$

$\frac{u^2}{4} + \frac{2\sqrt{3}\,uv}{4} + \frac{3v^2}{4} = \frac{u\sqrt{3}}{2} + \frac{v}{2}$ $(\times 4)$

u^2

$x = $ $\frac{u^2}{4} + \frac{2\sqrt{3}\,uv}{4 \cdot 2} + \frac{3v^2}{4} = \frac{u\sqrt{3}}{2} - \frac{v}{2}$ (eq)

$u^2 +$