HUKUM - HUKUM DOT VECTOR

$\vec{a}$, $\vec{b}$ & $\vec{c}$ di R^2

p bilangan real

1) $\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$ (HUKUM KOMUTATIF)

2) $\vec{a} \cdot (\vec{b} + \vec{c}) = \vec{a} \cdot \vec{b} + \vec{a} \cdot \vec{c}$ (HUKUM DISTRIBUTIF)

3) $p(\vec{a} \cdot \vec{b}) = (p\vec{a}) \cdot \vec{b} = \vec{a} \cdot (p\vec{b})$

$5(\vec{a} \cdot \vec{b}) = (5\vec{a}) \cdot \vec{b} = \vec{a} \cdot (5\vec{b})$

4) $\vec{0} \cdot \vec{a} = \underbrace{|\vec{0}|}_{0} \cdot |\vec{a}| \cdot \cos\theta$

$\vec{0} \cdot \vec{a} = 0$

$\vec{0} = (0,0)$

$|\vec{0}| = \sqrt{0^2 + 0^2} = 0$

$\vec{a} \cdot \vec{b} = |\vec{a}| \cdot |\vec{b}| \cdot \cos\varphi$

5) $\vec{a} \cdot \vec{a} = |\vec{a}| \cdot |\vec{a}| \cdot \cos 0$

$\cos 0 = 1$

$\vec{a} \cdot \vec{a} = |\vec{a}|^2$

6) $\vec{a} \neq \vec{0} \rightarrow |\vec{a}| > 0 \rightarrow |\vec{a}|^2 > 0$

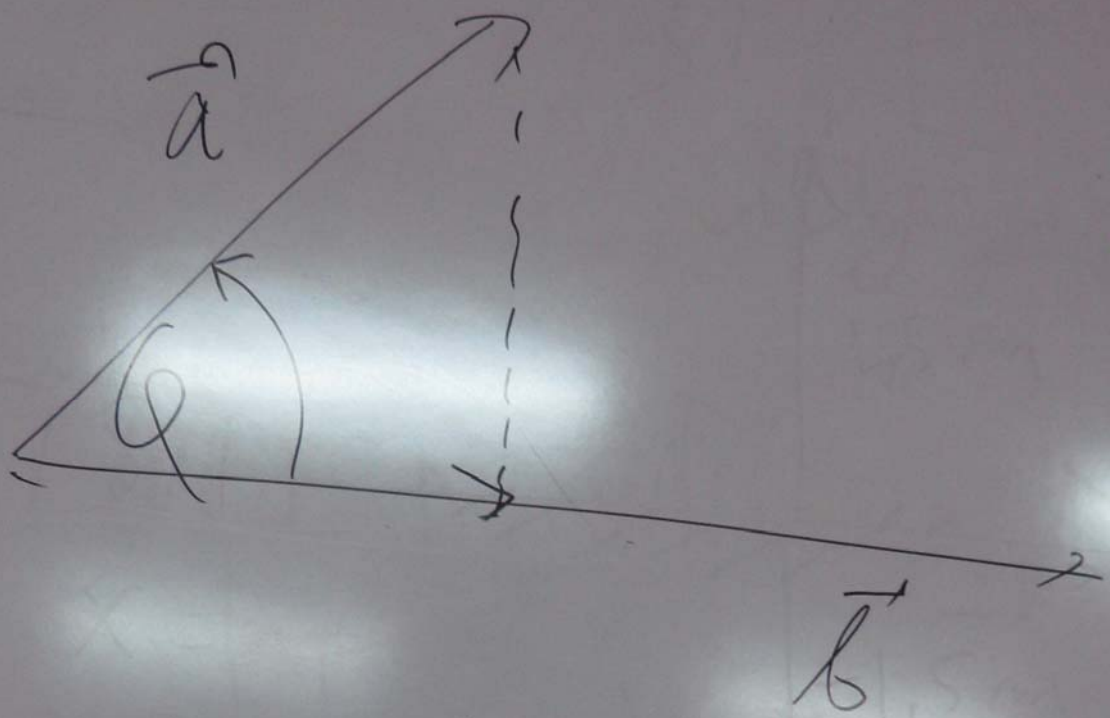
$\rightarrow \vec{a} \cdot \vec{a} = |\vec{a}|^2$

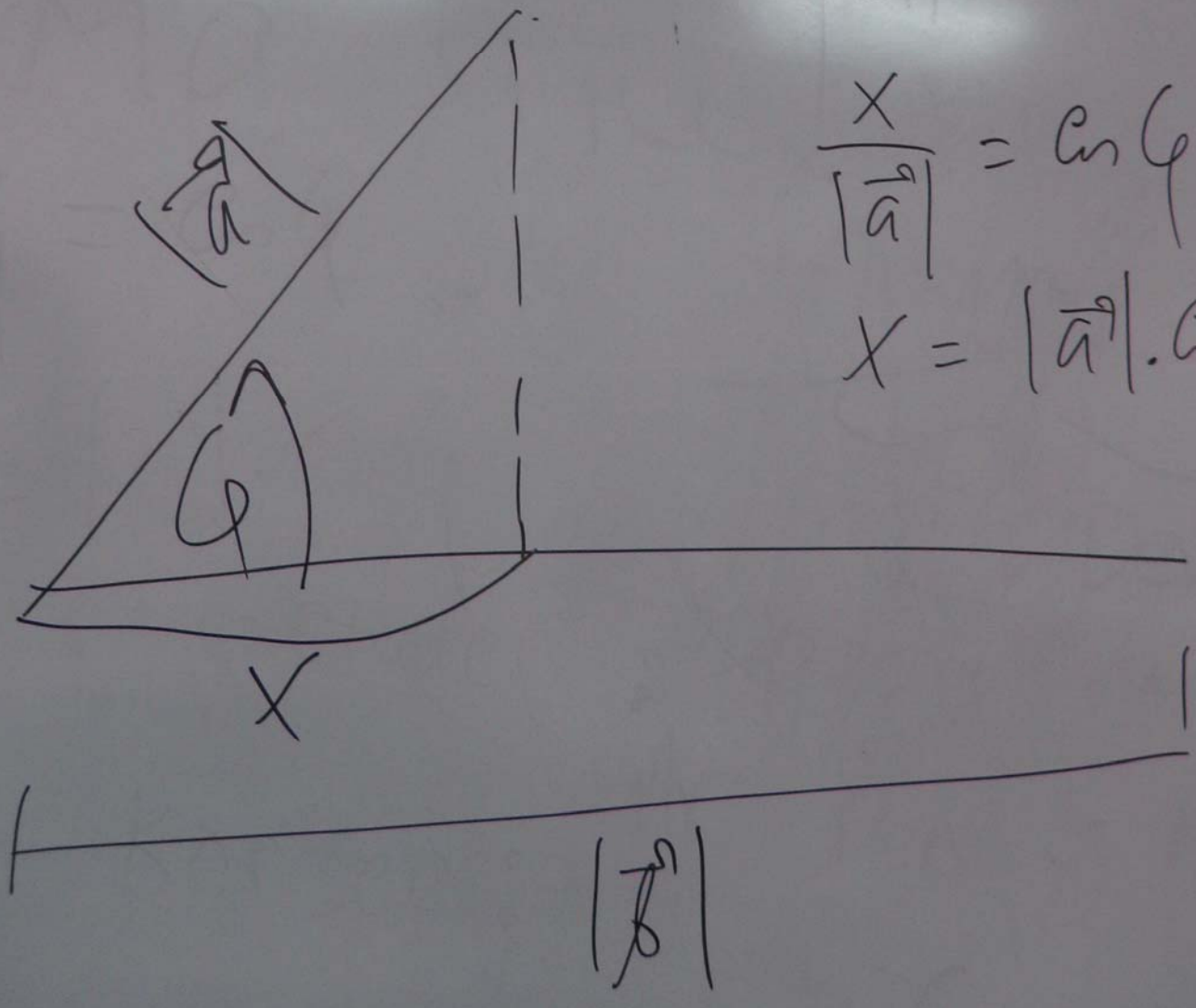
7) $\rightarrow \vec{a} \cdot \vec{a} > 0$

$\vec{a} = \vec{0} \rightarrow |\vec{a}| = 0$

$\rightarrow \vec{a} \cdot \vec{a} = |\vec{a}|^2 = 0^2 = 0$

SUDUT ANTARA $\vec{a}$ & $\vec{b}$ = φ





$$\frac{x}{|\vec{a}|} = \cos\varphi$$

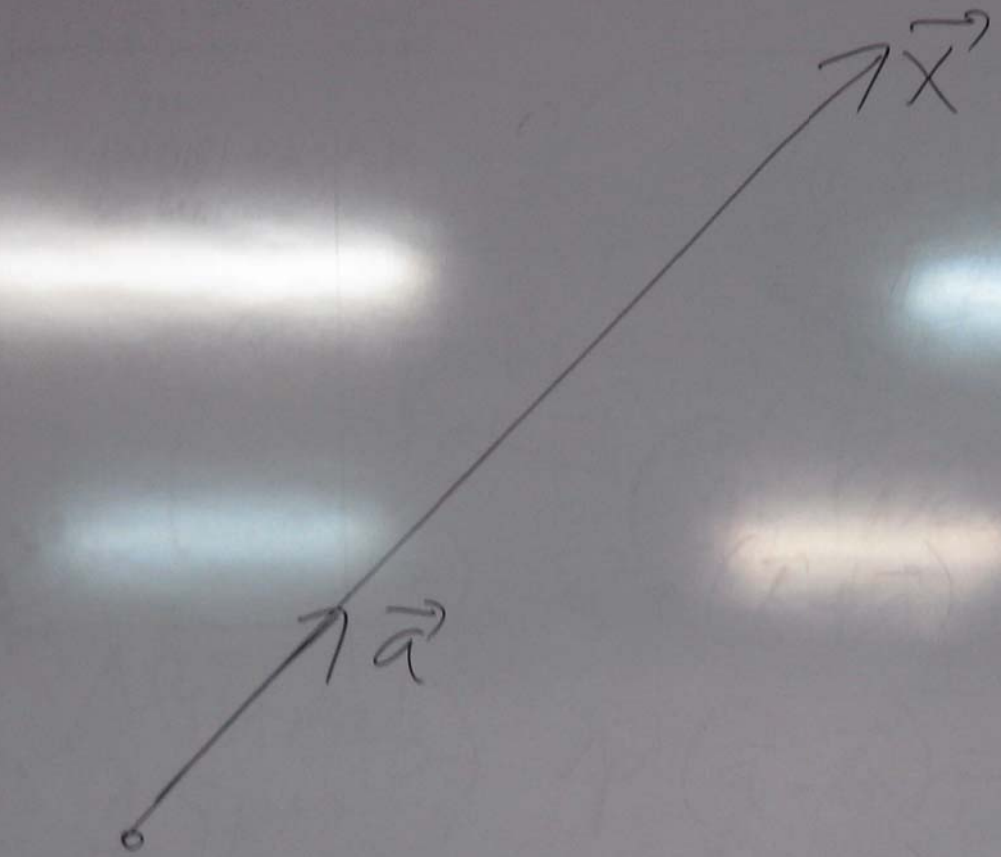
$$x = |\vec{a}| . \cos\varphi$$

$$\vec{a} \cdot \vec{b} = x \cdot |\vec{b}|$$

$$= |\vec{a}| \cdot \cos\varphi \cdot |\vec{b}|$$

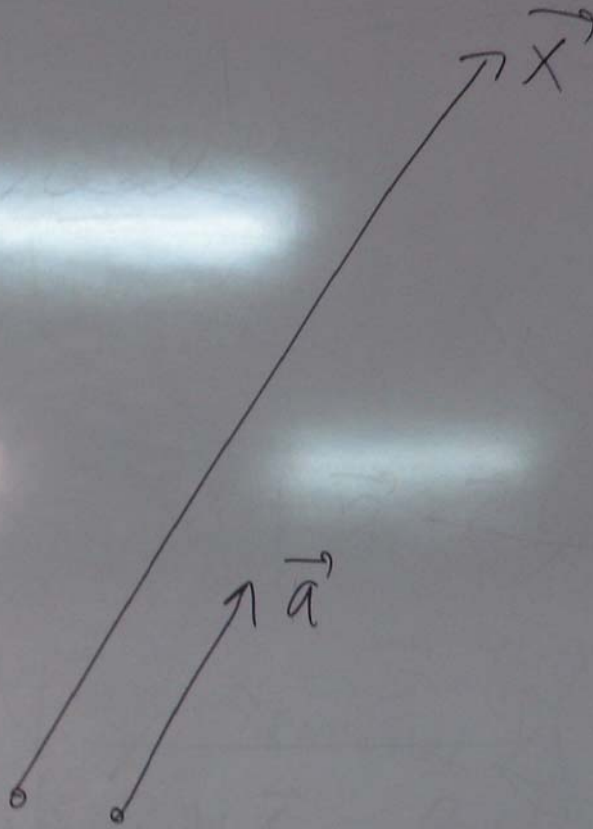
$$\boxed{\vec{a} \cdot \vec{b} = |\vec{a}| \cdot |\vec{b}| \cdot \cos\varphi}$$

PERS. GARIS LURUS PADA BIDANG



$\vec{a}$ & $\vec{x}$ SEGARIS
DAN SEARAH

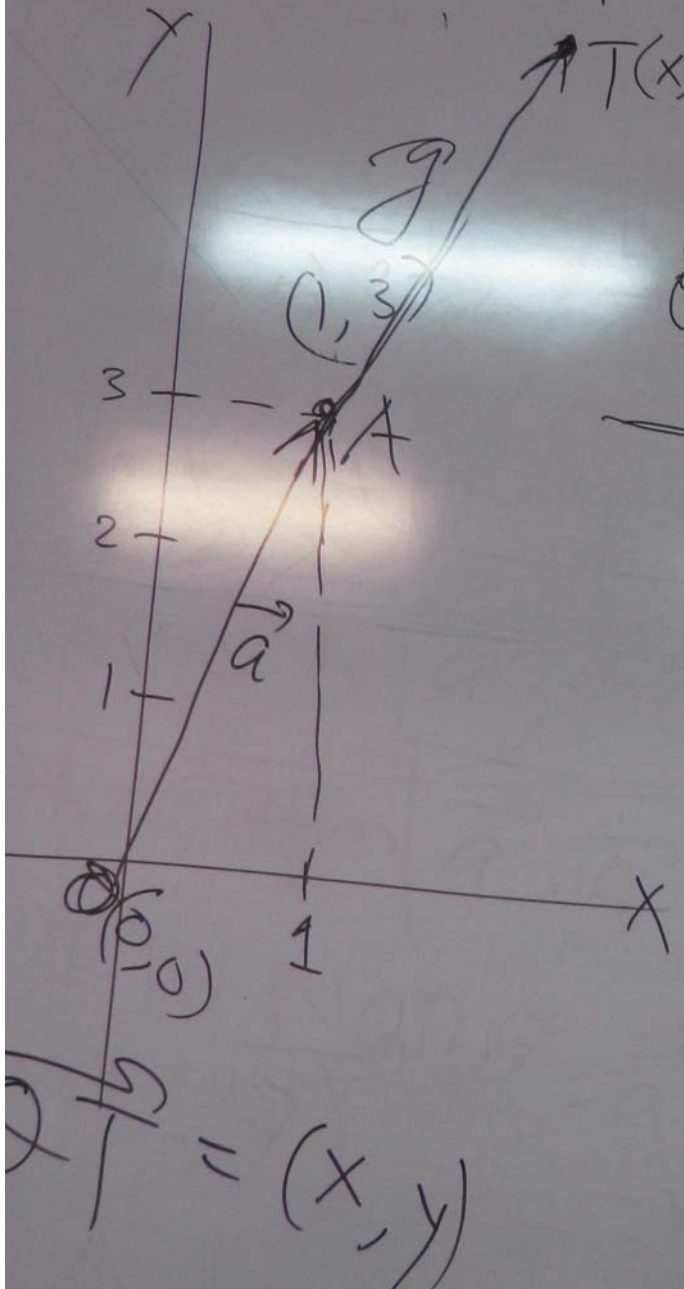
$\vec{x} = \lambda . \vec{a}$



$\vec{a}$ & $\vec{x}$ SEJAJAR
DAN SEARAH

$\vec{x} = \lambda . \vec{a}$

TENTUKAN PERS. GARIS g YANG MELALUI $O(0,0)$ DAN $A(1,3)$!



$\overrightarrow{OT} = (x,y)$

$\overrightarrow{OA} = \vec{a} = (1,3)$

$\overrightarrow{OT}$ & $\overrightarrow{OA}$ SEGARIS & SEARAH

$\overrightarrow{OT} = \lambda . \overrightarrow{OA}$

$(x,y) = \lambda . \vec{a}$

$(x,y) = \lambda (1,3)$

$(x,y) = (\lambda, 3\lambda)$

PERS. VEKTOR DARI GARIS g

$$x = \lambda$$
$$y = 3\lambda$$

PERS. PARAMETER DARI GARIS g

$$\frac{y}{x} = \frac{3\lambda}{\lambda}$$

$$\frac{y}{x} = 3$$

$$y = 3x$$

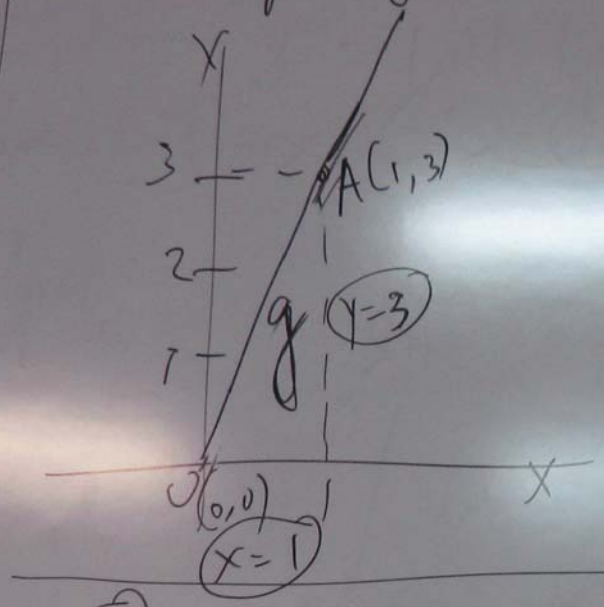
PERS. CARTESIUS DARI GARIS g

METER

g

CARA DI SLTA (SMA)

Pers. grs. g mel $O(0,0)$ & $A(1,3)$
$x_1\ y_1$ $x_2\ y_2$



I) $\frac{y-y_1}{y_2-y_1} = \frac{x-x_1}{x_2-x_1}$

$\frac{y-0}{3-0} = \frac{x-0}{1-0}$

$\frac{y}{3} = \frac{x}{1}$

$y = 3x$

II) $m = tg\alpha = \frac{y}{x} = \frac{3}{1} = 3$

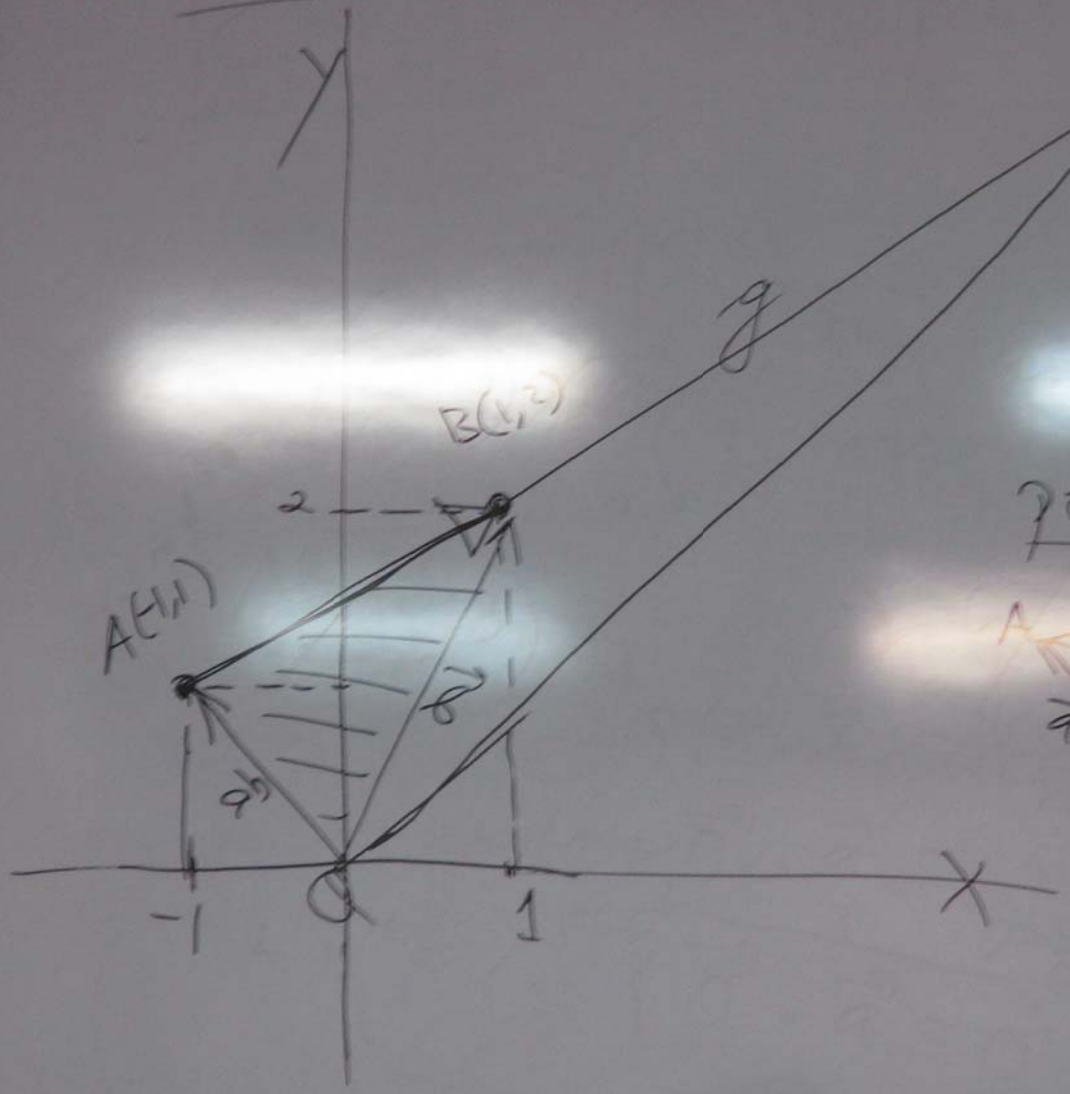
Pers. grs. g mel A(1,3) — $y - y_1 = m(x - x_1)$

$y - 3 = 3(x - 1)$

$y - 3 = 3x - 3$

$y = 3x$

PERS. GARIS g MELALUI $A(-1,1)$ & $B(1,2)$

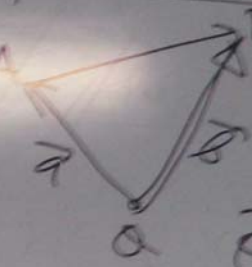


$\overrightarrow{OA} = \vec{a} = (-1,1)$

$\overrightarrow{OB} = \vec{b} = (1,2)$

$\overrightarrow{OT} = (x,y)$

PERHATIKAN $\triangle OAB$



$\overrightarrow{OA} + \overrightarrow{AB} = \overrightarrow{OB}$

$\vec{a} + \overrightarrow{AB} = \vec{b}$

$\boxed{\overrightarrow{AB} = \vec{b} - \vec{a}}$

$\overrightarrow{AB} = (1,2) - (-1,1)$

$= (2,1)$

$\overrightarrow{AB}$ & $\overrightarrow{AT}$ SEGARIS & SEARAH

$\longrightarrow \quad \overrightarrow{AT} = \lambda \cdot \overrightarrow{AB} = \lambda \cdot (2,1)$

$= (2\lambda, \lambda)$

PERHATIKAN $\triangle OAT$

$\overrightarrow{OT} = \overrightarrow{OA} + \overrightarrow{AT}$

$(x,y) = \vec{a} + (2\lambda, \lambda)$

$(x,y) = (-1,1) + (2\lambda, \lambda)$

$(x,y) = (-1+2\lambda, 1+\lambda)$

PERS. VEKTOR DARI GARIS g

$x = -1 + 2\lambda$
$y = 1 + \lambda$ | x1 / x2 | PERS. PARAMETER DARI GARIS g

$x = -1 + 2\lambda$

$2y = 2 + 2\lambda$ (−)

$x - 2y = -3$

$x - 2y + 3 = 0$

PERS. CARTESIUS DARI grs. g

CARA DI SLTA (SMA)

Pers. gars. g MELALUI $A(-1,1)$ & $B(1,2)$
$x_1\ y_1$ $x_2\ y_2$

$$\frac{y-y_1}{y_2-y_1} = \frac{x-x_1}{x_2-x_1}$$

$$\frac{y-1}{2-1} = \frac{x-(-1)}{1-(-1)}$$

$$\frac{y-1}{1} = \frac{x+1}{2}$$

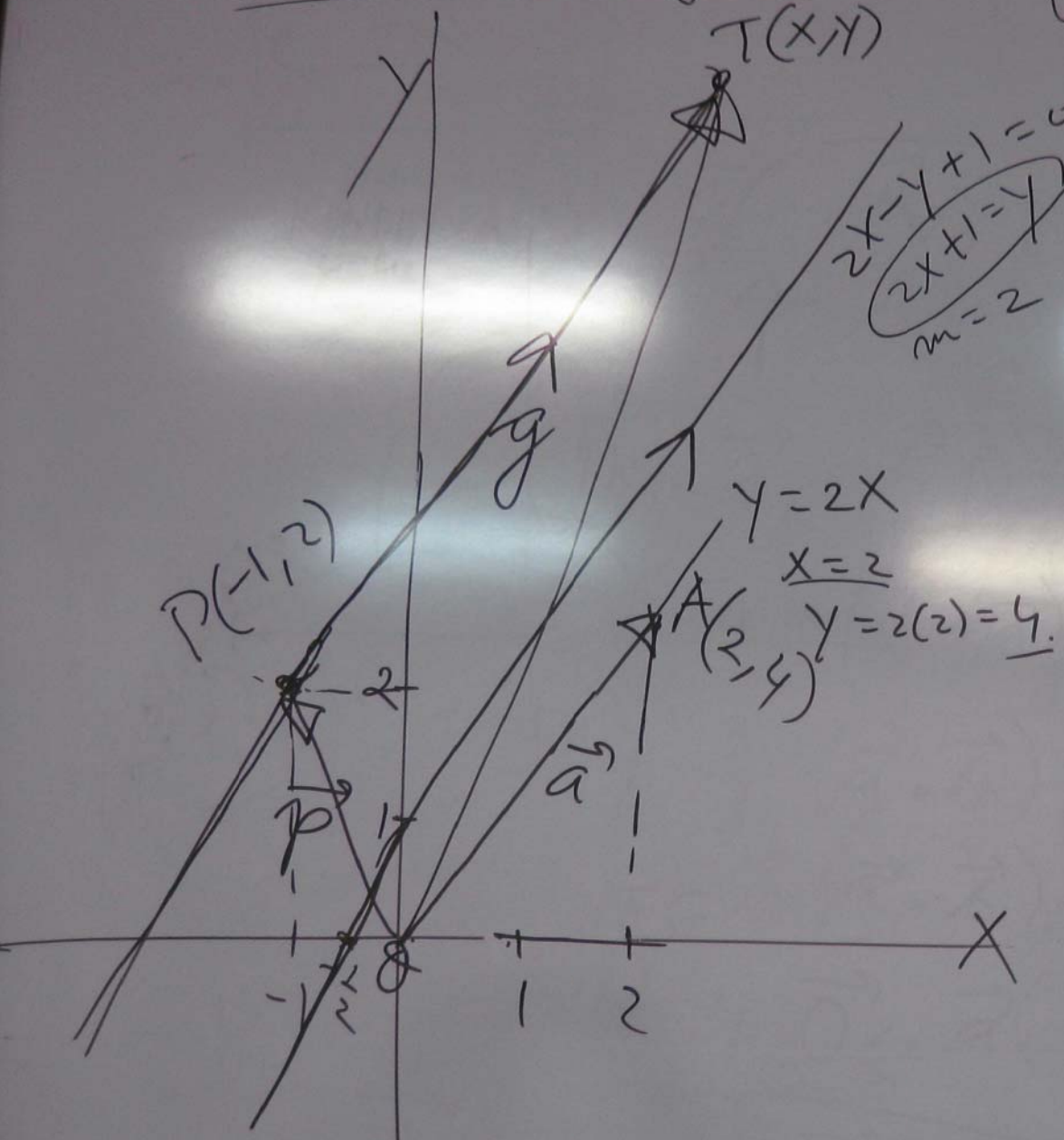
$$1.(x+1) = 2(y-1)$$

$$x+1 = 2y-2$$

$$x-2y+1+2=0$$

$$x-2y+3=0$$

PERS. GARIS g YANG { MELALUI $P(-1,2)$ // $2x-y+1=0$.



$2x-y+1=0$

$2x+1=y$

$m=2$

$y=2x$

$x=2$

$y=2(2)=4.$

$2x-y+1=0$

$x=0 \rightarrow 2(0)-y+1=0$

$1=y \rightarrow (0,1)$

$y=0 \rightarrow 2x-0+1=0$

$2x=-1$

$x=-\frac{1}{2} \rightarrow (-\frac{1}{2},0)$

$\overrightarrow{OP}=\vec{p}=(-1,2)$

$\overrightarrow{OT}=(x,y)$

$\overrightarrow{OA}=\vec{a}=(2,4)$

$\overrightarrow{PT}$ & $\overrightarrow{OA}$ SEJAJAR & SEARAH

$\longrightarrow \overrightarrow{PT} = \lambda . \overrightarrow{OA}$

$= \lambda . \vec{a} = \lambda (2, 4)$

$= (2\lambda, 4\lambda)$

PERHATIKAN $\triangle OPT$

$\overrightarrow{OT} = \overrightarrow{OP} + \overrightarrow{PT}$

$(x, y) = \vec{p} + \lambda . \vec{a}$

$(x, y) = (-1, 2) + (2\lambda, 4\lambda)$

$(x, y) = (-1 + 2\lambda, 2 + 4\lambda)$

PERS. VEKTOR DARI GARIS g

$x = -1 + 2\lambda$ | $\times 2$

$y = 2 + 4\lambda$ | $\times 1$

PERS. PARAMETER DARI GARIS g

$2x = -2 + 4\lambda$

$y = 2 + 4\lambda$ (−)

$2x - y = -4$

$2x + 4 = y$

$y = 2x + 4$

EKSPLISIT

$2x - y + 4 = 0$

IMPLISIT

PERS. CARTESIUS DARI grs. g

CARA DI SLTA (SMA)

Pers. garis g melalui { melalui P(-1,2) // $y = 2x + 1$

$m_1 = 2$

Syarat // $\rightarrow$ $m_1 = m_2$

$2 = m_2$

Pers. GARIS g melalui $P(\overset{x_1}{-1}, \overset{y_1}{2})$

$y - y_1 = m_2(x - x_1)$

$y - 2 = 2(x - (-1))$

$y - 2 = 2x + 2$

$y = 2x + 2 + 2$

$y = 2x + 4$