# KUNCI JAWABAN TUTOR KVJ LATIHAN SOAL PERTEMUAN 2

Precamaan Parametrik = 
$$(a\theta - a \sin \theta)$$
;  $a - a \cos \theta$ )
$$= (10\theta - 10 \sin \theta)$$
;  $a - a \cos \theta$ )
$$= (10\theta - 10 \sin \theta)$$
;  $a - a \cos \theta$ )
$$= (10\theta - 10 \cos \theta)$$

We know kecepatan
$$\frac{d\overline{f}}{d\theta} : \frac{d(10\theta - 10 \cos \theta)}{d\theta} : \frac{d\theta}{d\theta} : \frac{d(10\theta - 10 \cos \theta)}{d\theta} : \frac{d\theta}{d\theta} :$$

d.) Vektor singgung unit.
$$\vec{T} : \frac{\vec{V}(\theta)}{||\vec{V}(\theta)||} = \frac{\left(20 \sin^2 \frac{\theta}{2}, 20 \sin \frac{\theta}{2} \cos \frac{\theta}{2}\right)}{20 \sin \left(\frac{\theta}{2}\right)}$$

$$= \left(\pm \sin \frac{\theta}{2}, \pm \cos \frac{\theta}{2}\right).$$

e.) Panjang Busur
$$S = 0^{2\pi} \frac{ds}{d\theta} d\theta = 0^{2\pi} \frac{ds}{d\theta} \sin \frac{\theta}{2} d\theta \cdot \frac{d\theta}{2} - 40 \cos \frac{\theta}{2} = 0^{2\pi} \frac{d\theta}{2} + \frac{d\theta}{2} = 0^{2\pi} \frac{d\theta}{2}$$

$$\# \left[ \Gamma \left( \theta \right) : \frac{T' \left( \theta \right)}{\| T' \left( \theta \right) \|} \right]$$

$$= \frac{\cot \frac{\theta}{2}, -\sin \frac{\theta}{2}}{1}$$

$$= \left( \cot \frac{\theta}{2}, -\sin \frac{\theta}{2} \right)$$

$$k \alpha_T = \frac{d^2s}{dt^2}$$

$$T'(\theta): \cot \frac{\theta}{2}, -\sin \frac{\theta}{2}.$$

$$||T'(\theta)||: \sqrt{(\cot \frac{\theta}{2})^2 + (-\sin \frac{\theta}{2})^2}$$

$$= \sqrt{\cos^2\frac{\theta}{2} + \sin^2\frac{\theta}{2}},$$

$$* \alpha_{H} = \left(\frac{d_{1}}{d\theta}\right)^{2} \cdot \xi .$$

$$=-5 \sin \frac{\theta}{2} \left( \frac{\sin \theta}{2}, \frac{\cos \theta}{2}, \frac{\theta}{2} \right) + 20 \sin \frac{\theta}{2} \left( \cos \frac{\theta}{2}, -\sin \frac{\theta}{2} \right)$$

$$= \left(-5 \sin^2 \frac{10}{2} - 5 \sin \frac{10}{2} \cos \frac{10}{2}\right) + \left(20 \sin \frac{10}{2} \cos \frac{10}{2} - 20 \cos \frac{10}{2}\right).$$

$$= \left(-5 \sin^2 \frac{3}{2} + 20 \sin \frac{\theta}{2} \cos \frac{2}{2} + -5 \sin \frac{\theta}{2} \cos \frac{2}{2} - 20 \sin^2 \frac{\theta}{2}\right).$$

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x2+ y1+ 5xy12.	7	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
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2x konstanta.	AR DIGAR L	rest Kix dean	
	5xy+2) = 2x + 54		88 .
	<del>2</del> ×	25	82
- Shirts: han (-3,7,0	) ke 2x+1y.		
- Maha Milai of di	(-32,0) adalah 2	23 +7.2 = -6	+ 10
- Ax	9 = 601 (484 182	+4+toa)	
	1912 1 1917 1 0	cos (5w+ 10x)	•
+) 2F, hita turunh	an fongsi tuhadap y		
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,			

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· > Kita anagap x y konstan maha:		Level Lorent	- X4
8F = x2( sincsytioz , cos (2x+122)	CKE 17 F	11412	. 48
82 82	XS		ide
	2 (0)	NEW J NA	Jack Royal
> Tomphan Product Rule: (f.g) = f! g+ fg	45 CZ	eta de	ANAM .
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f' = 10 cos (54+ 102) 31=-125in (	2 2 1 12 2	, )	
court country of due brandlan up the topic,			- 3-6 (4
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2= x (10 (05 (5y+102) (05 (2+1122) -  22	12 Sin (	(2 x + 122)	sin csy+102
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2= x (10 (05 (5y+102) (05 (2+1122) -  22	12 Sin (	(2 x + 122)	sin csy+102
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### Carilah dan tentukan jenis titik kritis pada

$$f(x,y) = 7x - 8y + 2xy - x^2 + y^3$$

### Langkah 1

Carilah turunan parsial pertama dan kedua terhadap x dan y (fx, fxx, fy, fyy), serta turunan parsial pertama terhadap xy (fxy). Maka akan didapatkan nilai-nilai sebagai berikut:

$$egin{aligned} f_x = 7 + 2y - 2x & f_y = -8 + 2x + 3y^2 \ f_{x\,x} = -2 & f_{x\,y} = 2 & f_{y\,y} = 6y \end{aligned}$$

## Langkah 2

Menentukan titik kritis dengan membuat turunan pertama terhadap x (fx) dan turunan pertama terhadap y (fy) bernilai nol, seperti di bawah

$$egin{aligned} f_x &= 0: \ 7+2y-2x = 0 \ & \ f_y &= 0: -8+2x+3y^2 = 0 \ & 
ightarrow & x = 4-rac{3}{2}y^2 \end{aligned}$$

Substitusikan nilai x pada persamaan pertama untuk mendapatkan nilai y

$$0 = 7 + 2y - 2\left(4 - rac{3}{2}y^2
ight) = 3y^2 + 2y - 1 = \left(3y - 1
ight)\left(y + 1
ight) \quad 
ightarrow \quad y = -1, \;\; y = rac{1}{3}$$

Substitusikan nilai y ke dalam persamaan x untuk mendapatkan titik-titik sebagai berikut.

$$y=-1: x=4-rac{3}{2}(-1)^2=rac{5}{2} \quad \Rightarrow \quad \left(rac{5}{2},-1
ight)$$

$$y=rac{1}{3}:x=4-rac{3}{2}\Big(rac{1}{3}\Big)^2=rac{23}{6}\quad\Rightarrow\quad \Big(rac{23}{6},rac{1}{3}\Big)$$

### Langkah 3

Tentukan nilai D dengan memasukkan nilai-nilai turunan yang telah didapat pada langkah 1.

$$D\left(x,y
ight)=f_{x\,x}f_{y\,y}-\left[f_{x\,y}
ight]^{2}=\left[-2
ight]\left[6y
ight]-\left[2
ight]^{2}=-12y-4$$

## Langkah 4

Tentukan jenis titik kritis dengan memasukkan nilai x dan y pada D

$$\left(\frac{5}{2},-1\right) \qquad : \quad D\left(\frac{5}{2},-1\right)=8>0 \qquad f_{x\,x}\left(\frac{5}{2},-1\right)=-2<0 \qquad \qquad \text{Relative Maximum}$$
 
$$\left(\frac{23}{6},\frac{1}{3}\right) \qquad : \quad D\left(\frac{23}{6},\frac{1}{3}\right)=-8<0 \qquad \qquad \text{Saddle Point}$$