

# Pembahasan Latihan Soal

## TKDU – Matematika Dasar



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### Latihan TKDU Memuat materi :

- 1) Kemampuan Matematika Dasar
- 2) Kemampuan Bahasa Indonesia
- 3) Kemampuan Bahasa Inggris

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Untuk Persiapan Ujian Tulis  
Seleksi Kedokteran via UM dan  
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Oleh Team [UjianTulis.com](http://UjianTulis.com)

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## Pembahasan Soal

Disusun oleh : Team [fk.ujiantulis.com](http://fk.ujiantulis.com)

1. **Jawab: B**

$$\begin{aligned}(p \vee q) \rightarrow r &= \sim (p \vee q) \vee r \\ &= (\sim p \wedge \sim q) \vee r \\ &= (\sim p \vee r) \wedge (\sim q \vee r) \\ &= (p \rightarrow r) \wedge (q \rightarrow r)\end{aligned}$$

2 **Jawab: D**

Garis yang melalui A(3,1) dan B(9,3)

$$\frac{y-1}{x-3} = \frac{3-1}{9-3} \Rightarrow 6y-6=2x-6 \Rightarrow 3y-x=0$$

Garis yang melalui C(6,0) dan D(0,2)

$$\frac{y-0}{x-6} = \frac{2-0}{0-6} \Rightarrow -6y=2x-12 \Rightarrow -3y-x=-6$$

Titik potong antara garis AB dan garis CD

$$\begin{array}{rcl} 3y - x = 0 & \xrightarrow{+} & 3y - 3 = 0 \\ -3y - x = -6 & \xrightarrow{+} & y = 1 \\ \hline -2x = -6 & \Rightarrow & x = 3 \end{array}$$

3 **Jawab: E**

x = motor; y = mobil;

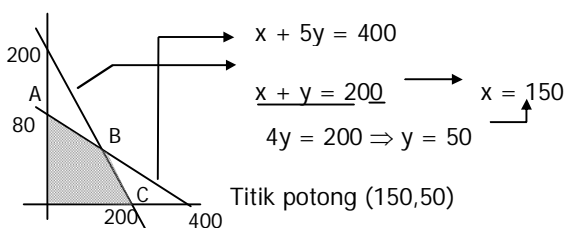
Fungsi objektif:  $f(x,y)=1000x+2000y$

Kendala:  $x \geq 0$

$y \geq 0$

$x + y \leq 200$  dan

$x + 5y \leq 400$



$F_{\text{maka}} = 250.000$

4 **Jawab: A**

$$\bullet > \bar{X} = 5,65 \Rightarrow \frac{X_1+X_2+\dots+X_{19}+X_{20}}{20} = 5,65$$

$$\Rightarrow X_1 + X_2 + \dots + X_{19} + X_{20} = 113$$

$$\Rightarrow X_2 + \dots + X_{19} = 113 - (X_1 + X_{20})$$

- > Nilai terendah dan tertinggi tidak diikuti rata-rata menjadi 5,5

$$\frac{x_2 + \dots + x_{19}}{18} = 5,5$$

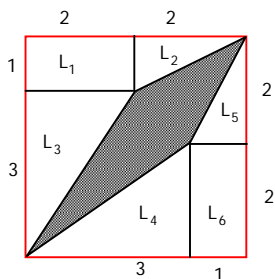
$$x_2 + \dots + x_{19} = 99$$

$$113 - (x_1 + x_{20}) = 99$$

$$x_1 + x_{20} = 14$$

- > Jangkauan = 4  $\Rightarrow x_{20} - x_1 = 4$  —  
 $2x_1 = 10 \Rightarrow x_1 = 5$

5 **Jawab: C**



$$\begin{aligned} L_{\text{arsir}} &= 16 - (L_1 + L_2 + L_3 + L_4 + L_5 + L_6) \\ &= 16 - (2 + 1 + 3 + 3 + 1 + 2) \\ &= 4 \end{aligned}$$

6 **Jawab: A**

$$Y_1 + Y_2 = \alpha\beta^4 + \alpha^4\beta = \alpha\beta(\alpha^3 + \beta^3)$$

$$= \alpha\beta [(\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)]$$

$$= -2 [3^3 - 3(-2)3] = -90$$

$$Y_1 \cdot Y_2 = \alpha\beta^4 \cdot \alpha^4\beta = (\alpha\beta)^5 = (-2)^5 = -32$$

PK akar-akar  $Y_1 = \alpha\beta^4$  dan  $Y_2 = \alpha^4\beta$  adalah

$$x^2 - (Y_1 + Y_2)x + Y_1 \cdot Y_2 = 0$$

$$x^2 + 90x - 32 = 0$$

7 **Jawab: E**

$$y = a(x - x_1)(x - x_2)$$

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

Melalui (0,1)

$$1 = a \cdot 1 \cdot (-3)$$

$$a = -\frac{1}{3}$$

Diperoleh, persamaan grafiknya

$$y = -\frac{1}{3}(x+1)(x-3)$$
$$y = -\frac{1}{3}x^2 + \frac{2}{3}x + 1$$

Maka  $3a + 6b + 3c = -1 + 4 + 3 = 6$

8 **Jawab: B**

$$a = 4^{44} = (4^4)^{11} = 256^{11}$$

$$b = 3^{55} = (3^5)^{11} = 243^{11}$$

$$c = 5^{33} \cdot 2^{11} = (5^3)^{11} \cdot 2^{11} = 125^{11} \cdot 2^{11} = 250^{11}$$

$$d = 6^{22} \cdot 7^{11} = (6^2)^{11} \cdot 7^{11} = 36^{11} \cdot 7^{11} = 252^{11}$$

Dengan demikian  $b < c < d < a$

9 **Jawab: B**

$$P + Q = \begin{pmatrix} -1 & 1 \\ 9 & 8 \end{pmatrix}$$

$$P - Q = \begin{pmatrix} 5 & -7 \\ 1 & -6 \end{pmatrix}$$

\_\_\_\_\_ +

$$2P = \begin{pmatrix} 4 & -6 \\ 10 & 2 \end{pmatrix}$$

$$P = \begin{pmatrix} 2 & -3 \\ 5 & 1 \end{pmatrix}$$

Maka determinan  $P = 2 - (-15) = 17$

10 **Jawab: E**

Diketahui  $a = r$ ,  $U_5 = \sqrt{3}$

$$\begin{aligned} U_5 &= \sqrt{3} & \frac{S_{40}}{S_{20}} &= \frac{a \frac{r^{40} - 1}{r - 1}}{a \frac{r^{20} - 1}{r - 1}} \\ ar^4 &= \sqrt{3} & &= \frac{r^{40} - 1}{r^{20} - 1} \\ r^5 &= \sqrt{3} & &= \frac{(r^{20} - 1)(r^{20} + 1)}{r^{20} - 1} \\ r^{20} &= (\sqrt{3})^4 = 9 & &= r^{20} + 1 \\ & & &= 10 \end{aligned}$$

11 Jawab: C

$$(x^2 - 4x)(x^2 - 4x - 1) < 20$$

$$(x^2 - 4x)(x^2 - 4x - 1) - 20 < 0$$

Misalkan  $p = x^2 - 4x$ , diperoleh

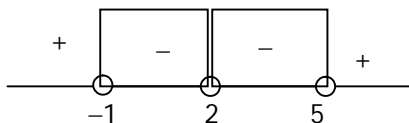
$$p(p - 1) - 20 < 0$$

$$p^2 - p - 20 < 0$$

$$(p - 5)(p + 4) < 0$$

$$(x^2 - 4x - 5)(x^2 - 4x + 4) < 0$$

$$(x + 1)(x - 5)(x - 2)^2 < 0$$



$$-1 < x < 5, x \neq 2$$

Jumlah semua bilangan bulat yang memenuhi adalah

$$0 + 1 + 3 + 4 = 8$$

12 Jawab: B

Supaya  $\log(|2x^2 - 13| - 5)$  terdefinisi, maka

$$|2x^2 - 13| > 5$$

$$|A| > B^2$$

$$A^2 > B^2$$

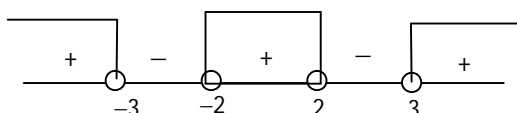
$$A^2 - B^2 > 0$$

$$(A + B)(A - B) < 0$$

$$(2x^2 - 8)(2x^2 - 18) < 0$$

$$(x^2 - 4)(x^2 - 9) > 0$$

$$(x + 2)(x - 2)(x + 3)(x - 3) > 0$$



$$x < -3 \text{ atau } -2 < x < 2 \text{ atau } x > 3$$

13 **Jawab: D**

$$f(x) = -ax^4 - bx^2 - x + 7$$

$$\begin{aligned} f(-10) &= 2 \\ -a \cdot (-10)^4 - b \cdot (-10)^2 - (-10) + 7 &= 2 \\ -a \cdot 10^4 - b \cdot 10^2 + 17 &= 2 \\ -a \cdot 10^4 - b \cdot 10^2 &= -15 \end{aligned}$$

Dengan demikian

$$\begin{aligned} f(10) &= -a \cdot 10^4 - b \cdot 10^2 - 10 + 7 \\ &= -a \cdot 10^4 - b \cdot 10^2 - 3 \\ &= -15 - 3 \\ &= -18 \end{aligned}$$

14 **Jawab: A**

$$\sec x = 2 \rightarrow \frac{1}{\cos x} = 2 \rightarrow \cos x = \frac{1}{2}$$

$$\begin{aligned} \sin\left(\frac{3}{2}\pi - x\right) + \cos(\pi + x) &= -\cos x - \cos x \\ &= -2\cos x \\ &= -1 \end{aligned}$$

15 **Jawab: C**

$$\begin{aligned} \lim_{n \rightarrow \infty} \left( \frac{3 + 9 + 15 + \dots + (6n - 3)}{2 + 4 + 6 + \dots + 2n} \right) \\ &= \lim_{n \rightarrow \infty} \left( \frac{\frac{n}{2}(2 \cdot 3 + (n-1) \cdot 6)}{\frac{n}{2}(2 \cdot 2 + (n-1) \cdot 2)} \right) \\ &= \lim_{n \rightarrow \infty} \left( \frac{6n}{2 + 2n} \right) \\ &= 3 \end{aligned}$$

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