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1 Nyatakan dalam garis bilangan dan notasi selang, masing2 notasi himpunan berikut:

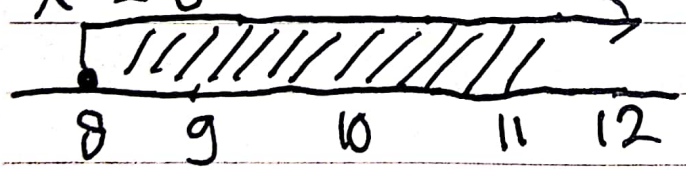
a. $X < 2$
b. $X \geq 8$
c $-2 < X < 8$
d $-8 < X \leq 2$
e $X < -2$ atau $X > 8$
F $X \leq -8$ atau $X \geq 2$

2 Jawaban

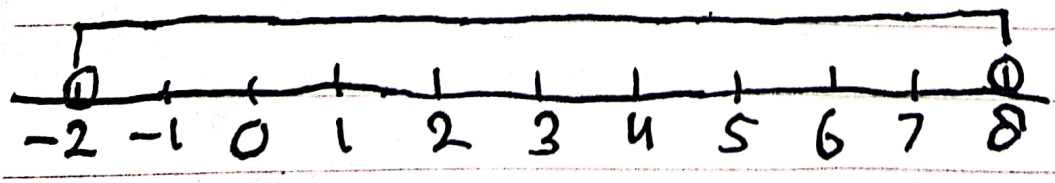
Bagian I

a $X \leq 2$

b $X \geq 8$



c $-2 < X < 8$



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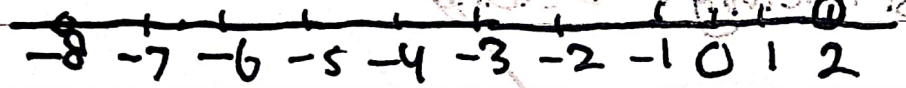
d $-8 < x \leq 2$

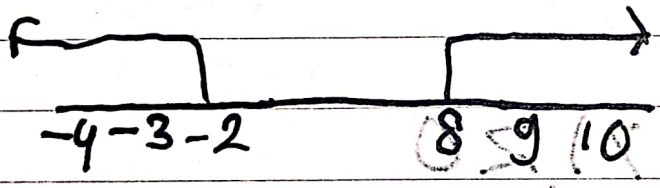


e $X < -2$ atau $X > 8$

Keterangan

$X < -2 = -3, -4, -5$ dst

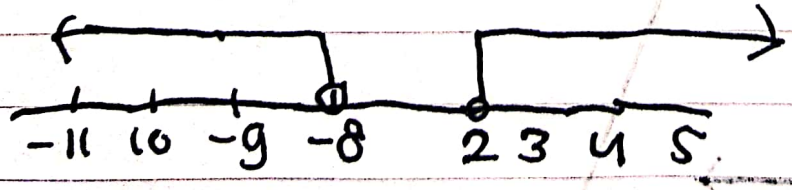
$X > 8 = 9, 10, 11, 12$



F $X \leq -8$ atau $X \geq 2$

$X \leq -8 = -9, -10, -11$

$X \geq 2 = 3, 4, 5, 6$



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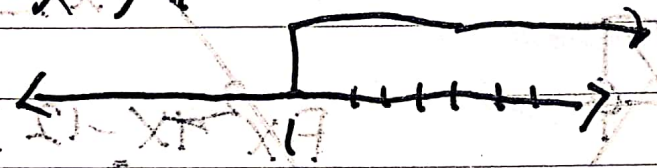
2) a. $3x - 5 < 4x - 6$

$3x - 4x < -6 + 5$

$-x < -1$

$x > 1$



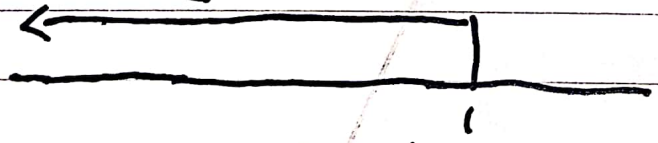
Notasi : $(1, \infty)$

b. $5x - 3 \geq 6x - 4$

$5x - 6x \geq -4 + 3$

$-x \geq -1$

$x \leq 1$



Notasi $(-\infty, 1]$

c. $-3 < 4x - 9 < 11$

$-3 + 9 < 4x < 11 + 9$

$6 < 4x < 20$

$3 < 2x < 10$

$\frac{3}{2} < x < 5$

Notasi : $(\frac{3}{2}, 5)$

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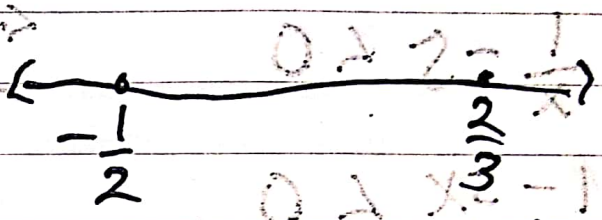
d. $-3 < 1-6x \leq 4$

$-3-1 < -6x \leq 4-1$

$-4 < -6x \leq 3$

$\frac{-4}{-6} > x \geq \frac{3}{-6}$



notasi : $(-\frac{1}{2}, \frac{2}{3}]$

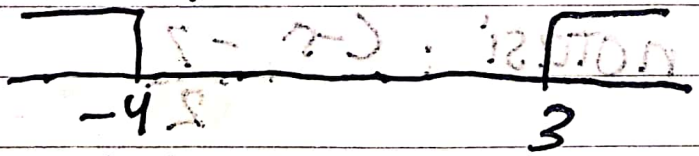
e. $2x-3 \leq 6-7x \leq 3x+11$

$2x-9 \leq -7x \leq 3x+5$

$9x-9 \leq 0 \leq 10x+5$

F. $x^2 + x - 12 > 0$

$(x+4)(x-3) > 0$



$x < -4$ atau $x > 3$

notasi : $(-\infty, -4)$ atau $(3, \infty)$

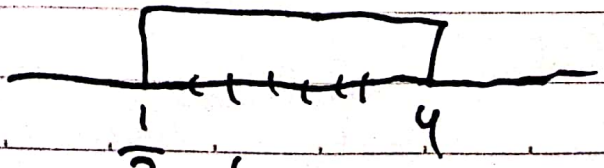
g. $3x^2 - 11x - 4 \leq 0$

$(3x+1)(x-4) \leq 0$

$3x+1 = 0 \cup x-4 = 0$

$3x = 1 \qquad x = 0$

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



notasi : $\frac{1}{3}, 4$

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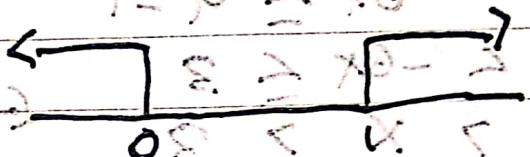
3) a $\frac{1}{x} < 5$

$\frac{1}{x} - 5 < 0$

$\frac{1-5x}{x} < 0$



notasi $(-\infty, 0)$ atau $(\frac{1}{5}, \infty)$

b $\frac{3}{x+5} > 2$

$\frac{3}{x+5} - 2 > 0$

$\frac{3-2(x+5)}{x+5} > 0$

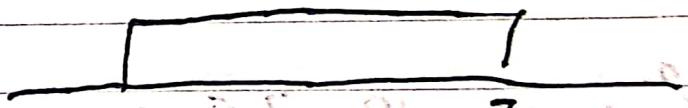
$\frac{3-2x-10}{x+5} > 0$

$\frac{-7-2x}{x+5} > 0$

$-2x - 7 = 0$ atau $x+5 = 0$

$-2x = 7$ $x = -5$

$x = \frac{7}{2}$



notasi : $(-5, -\frac{7}{2})$

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c $\frac{2x-1}{x-3} \geq 1$

$\frac{2x-1}{x-3} - 1 \geq 0$

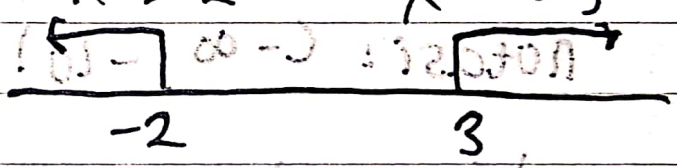
$\frac{2x-1-1(x-3)}{x-3} \geq 0$

$\frac{2x-1-x+3}{x-3} \geq 0$

$\frac{x+2}{x-3} \geq 0$

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

$x=-2$ $\quad x=3$



notasi : $(-\infty, -2)$ atau $(3, \infty)$

d $\frac{x-2}{x+4} < 2$

$\frac{x-2}{x+4} - 2 < 0$

$\frac{x-2-2(x+4)}{x+4} < 0$

$\frac{x-2-2x-8}{x+4} < 0$

$\frac{-x-10}{x+4} < 0$

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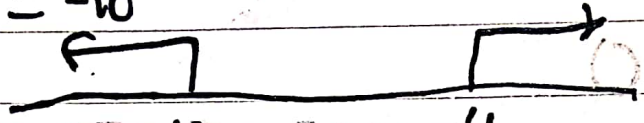
d. $-x-10=0$ atau $x+4\geq 0$

$-x=10$ $\quad x=-4$

$x=-10$



notasi : $(-\infty, -10)$ atau $(-4, \infty)$

e $(x+2)(2x-1)(3x+7)\geq 0$

$x+2=0$ $\quad 2x-1=0$ $\quad 3x+7=0$

$2x=1$ $\quad 3x=-7$

$x=\frac{1}{2}$ $\quad x=\frac{-7}{3}$

notasi : $(-\frac{7}{3}, -2)$ atau $(\frac{1}{2}, \infty)$

F $(2x+3)(3x-1)^2(x-5)<0$

$2x+3=0$ $\quad 3x-1=0$ $\quad x-5=0$

$2x=-3$ $\quad 3x=1$ $\quad x=5$

$x=\frac{-3}{2}$ $\quad x=\frac{1}{3}$

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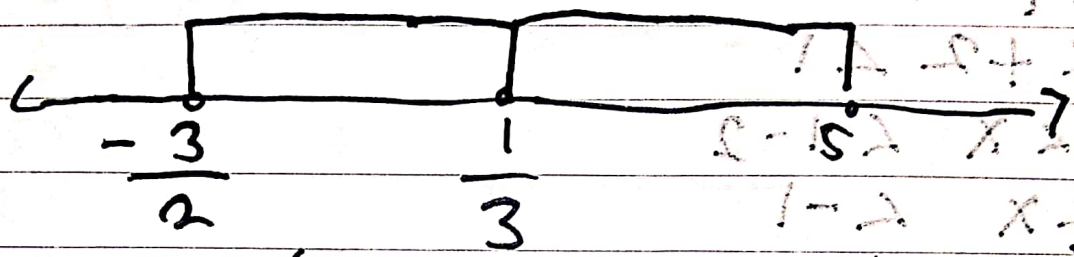
Kelas: TI 01

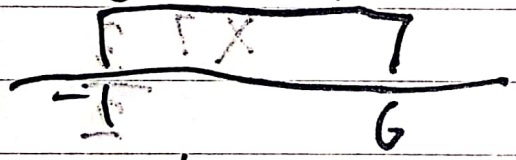


Notasi : $(-\frac{3}{2}, \frac{1}{3})$ atau $(\frac{1}{3}, 5)$

g $x^3 - 5x^2 - 6x + 1 < 0$

$x(x-6)(x+1)$

$x = 6 \quad x = -1$



4.) a $1{,}99 < \frac{1}{x} < 2{,}01$

$\frac{1}{1{,}99} > x > \frac{1}{1{,}99}$

$\frac{1}{2{,}01} < x < \frac{1}{1{,}99}$

notasi $(\frac{1}{2{,}01}, \frac{1}{1{,}99})$

b. $2{,}99 < \frac{1}{x+2} < 3{,}01$

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Kelas: TI 01

5) a $|x+2| < 1$

$-1 < x+2 < 1$

$-1-2 < x < 1-2$

$-3 < x < -1$

HP $\{x \mid -3 < x < -1\}$

b $|2x-1| > 2$

$2x-1 < -2$

$2x < -2+1$

$2x < -1$

$x < -\frac{1}{2}$

atau $2x-1 > 2$

$2x > 2+1$

$2x > 3$

$x > \frac{3}{2}$

HP $\{x \mid -\frac{1}{2} < x > \frac{3}{2}\}$

c $|4x+5| \leq 10$

$4x+5 \leq 10$

$4x \leq 10-5$

$4x \leq 5$

$x \leq \frac{5}{4}$

atau $4x+5 \geq -10$

$4x \geq -10-5$

$4x \geq -15$

$x \geq -\frac{15}{4}$

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Kelas: TI 01

d $|5x-6| > 1$

$5x-6 < -1$ atau $5x-6 > 1$

$5x < -1+6$ $5x > 1+6$

$5x < 5$ $5x > 7$

$x < 1$ $x > \frac{7}{5}$

e $\left|\frac{x}{4}+1\right| < 1$

$-1 < \frac{x}{4}+1 < 1$

$-2 < \frac{x}{4} < 0$

$-8 < x < 0$

HP $\{x \mid -8 < x < 0, x \in R\}$

F $\left|\frac{1}{x}-3\right| > 6 \longrightarrow \left|\frac{1-3x}{x}\right| > 6$

$\frac{1-3x}{x} > 6$ atau $\frac{1-3x}{x} < -6$

$1-3x-6x > 0$ $1-3x+6x < 0$

$1-9x > 0$

HP $\{x \mid$

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Kelas: TI 6I
Nim: 2021081007S

6.a $x^2 - 3x - 4 \geq 0$

$a = 1 \quad b = -3 \quad c = -4$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

$$x = \frac{3 \pm \sqrt{(9 + 16)}}{2}$$

$$x = \frac{3 \pm \sqrt{25}}{2}$$

$$= \frac{3+5}{2}$$

$$x_1 = \frac{3+5}{2} = \frac{8}{2} = 4$$

$$x_2 = \frac{3-5}{2} = \frac{-2}{2} = -1$$

maka, $x_1 = 4$ atau $x_2 = -1$

b. $x^2 - 4x + 4 \leq 0$

$a = 1, \quad b = -4, \quad c = 4$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 4}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{16 - 16}}{2}$$

$$x = \frac{4}{2}$$

$$x_1 = \frac{4}{2} = 2$$

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c $3x^2 + 17x - 6 \geq 0$

$a = 3 \quad b = 17 \quad c = -6$

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = \frac{-17 \pm \sqrt{17^2 - 4 \cdot 3 \cdot (-6)}}{2a}$$

$$X = \frac{-17 \pm \sqrt{289 + 72}}{6}$$

$$= \frac{-17 \pm \sqrt{361}}{6}$$

$$= \frac{-17 + 19}{6}$$

$$X_1 = \frac{-17 + 19}{6} = \frac{2}{6}$$

$$X_2 = \frac{-17 - 19}{6} = \frac{-36}{6}$$

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kelas: TI 01

d. $14x^2 - 11x - 15 \leq 0$

$a = 14,\ b = -11,\ c = -15$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4 \cdot 14 \cdot (-15)}}{2 \cdot 14}$$

$$x = \frac{11 \pm \sqrt{121 + 840}}{28}$$

$$x = \frac{11 \pm \sqrt{961}}{28}$$

$$x = \frac{11 \pm 31}{28}$$

$x_1 = \frac{11 + 31}{28}$ atau $x_2 = \frac{11 - 31}{28}$

$= \frac{42}{28}$ $= \frac{-20}{28}$

$= \frac{3}{2}$ $= \frac{-5}{7}$

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Kelas: TI 01

7. a $|x-1| < 2|x-2|$

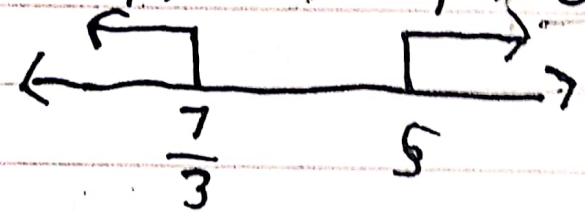
$(x-1)^2 < (2x-6)^2$

$x^2 - 2x + 1 < 4x^2 - 24x + 36$

$0 < 3x^2 - 22x + 35$

$3x^2 - 22x + 35 > 0$

$(3x-7)(x-5) > 0$



Hp

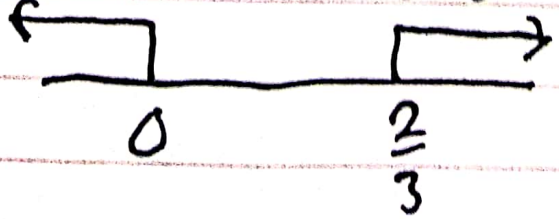
b $|2x-1| \geq |x-1|^2$

$(2x-1)^2 \geq (x-1)^2$

$4x^2 - 4x + 1 \geq x^2 - 2x + 1$

$3x^2 - 2x \geq 0$

$x(3x-2) \geq 0$



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c $2|2x-3| < |x+10|$

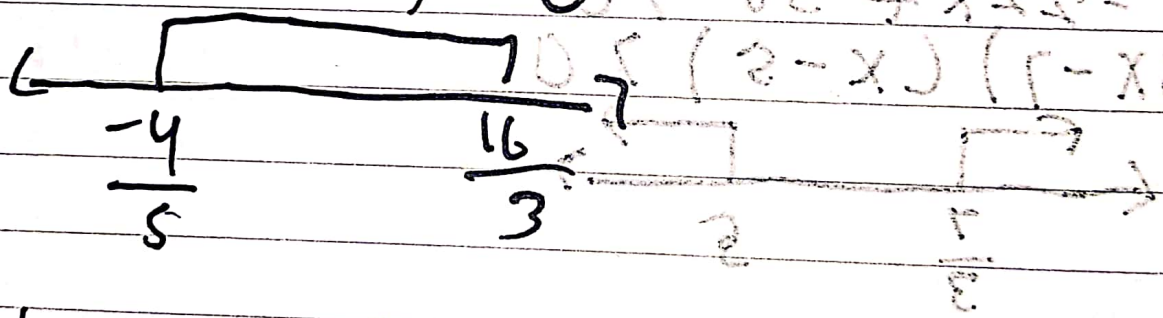
$|4x-6| < |x+10|$

$(4x-6)^2 < (x+10)^2$

$16x^2 - 48x + 36 < x^2 + 20x + 100$

$15x^2 - 68x - 64 < 0$

$(5x+4)(3-16) < 0$



d $|3x-1| < 2|x-6|$

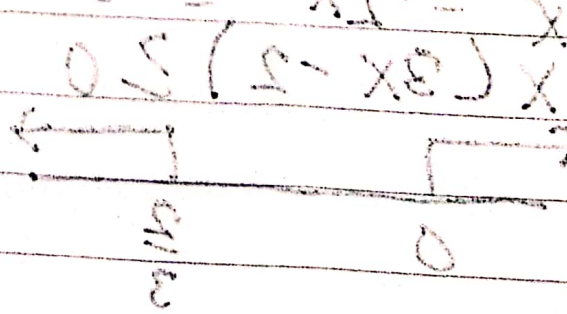
$|3x-1| < |2x-12|$

$(3x-1)^2 < (2x-12)^2$

$9x^2 - 6x - 1 < 4x^2 + 48x + 144$

$5x^2 + 42 - 143 < 0$

$(5x-13)(x+11) < 0$



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8.) $\frac{1}{R} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$

$10 \leq R1 \leq 20$, $20 \leq R2 \leq 30$, $30 \leq R3 \leq 40$

$\frac{1}{10} \geq \frac{1}{R1} \geq \frac{1}{20}$. $\frac{1}{20} > \frac{1}{R2} \geq \frac{1}{30}$. $\frac{1}{30} \geq \frac{1}{R3} \geq \frac{1}{40}$

$\frac{1}{20} \leq \frac{1}{R1} \leq \frac{1}{10}$, $\frac{1}{30} \leq \frac{1}{R2} \leq \frac{1}{20}$. $\frac{1}{40} \leq \frac{1}{R3} \leq \frac{1}{30}$

$\frac{1}{R} = \frac{1}{R3} + \frac{1}{R2} = \frac{1}{R1}$

$\frac{1}{R} = \left(\frac{1}{40} \cdot \frac{1}{30}\right) + \left(\frac{1}{30} \cdot \frac{1}{20}\right) + \left(\frac{1}{20} \cdot \frac{1}{10}\right)$

Interval $\frac{1}{R} = \left(\frac{1}{40} \cdot \frac{1}{10}\right) <= \frac{1}{40} \leq \frac{1}{R} \leq \frac{1}{10}$

Interval $R = 10 \leq R \leq 40$