LATIHAN 1.1

13. $25 \leq C \leq 90$    $C = \frac{5}{9}(F-32)$

$\Rightarrow 25 \leq \frac{5}{9}(F-32) \leq 90$

$25 \cdot \frac{9}{5} \leq (F-32) \leq 90 \cdot \frac{9}{5}$

$45 \leq (F-32) \leq 72$

$45+32 \leq F \leq 72+32$

$77 \leq F \leq 104$
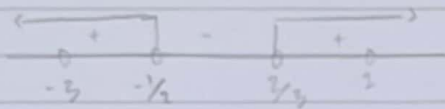
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15. f) $\dfrac{x^2+2x+3}{6x^2-x-2} \geq 0$

$x^2+2x+3 = 0$

$(x-1)(x+3)$

$x=1 \lor x=-3$

$6x^2-x-2 = 0$

$(3x-2)(2x+1)$

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

[sign chart: + at -3, - , + , at -1/2, -, 2/3, +, 1]

$x=0, \dfrac{0^2+2(0)+3}{6\cdot0^2-0-2} = \dfrac{3}{-2}$ (TM)

$x=-3, \dfrac{(-3)^2+2(-3)+3}{6(-3)^2-(-3)-2}$

$= \dfrac{9-6+3}{54+3-2} = 0$ (M)

$x=1, \dfrac{(1)^2+2(1)+3}{6(1^2)-(1)-2} \; \dfrac{6}{3} = 2$ (M)

$x=-\frac{1}{2}, \dfrac{(-\frac{1}{2})^2+2(-\frac{1}{2})+3}{6(-\frac{1}{2})^2-(-\frac{1}{2})-2} = \dfrac{\frac{9}{4}}{0} = \dfrac{2,25}{0}$ (TM)

$x=\frac{2}{3}, \dfrac{(\frac{2}{3})^2+2(\frac{2}{3})+3}{6(\frac{2}{3})^2-(\frac{2}{3})-2} = \dfrac{\frac{25}{9}}{0} = \dfrac{2,778}{0}$ (TM)

HP : $\{x, x < -\frac{1}{2} \text{ atau } x > \frac{2}{3}, x \in R\}$

$x \in (-\infty, -\frac{1}{2}) \cup (\frac{2}{3}, \infty)$

---

15. h) $\dfrac{x^3-2x^2}{10x^2-29x+10} \geq 0$

$x^3-2x^2 = 0$

$x^2(x-2) = 0$

$x=0 \lor x=2$

$10x^2-29x+10 = 0$

$10x^2-4x-25x+10 = 0$

$(10x^2-4x)+(-25x+10) = 0$

$2x(5x-2)-5(5x-2)=0$

$(2x-5)(5x-2) = 0$

$x=\frac{5}{2} \lor x=\frac{2}{5}$

[sign chart: - , 0, -, 2/5, +, 2, -, 5/2, +]
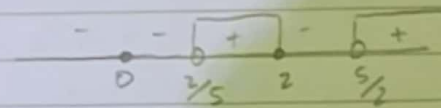
$x=0, \dfrac{0^3-2\cdot0^2}{10(0)^2-29(0)+10} = 0$ (M)

$x=2, \dfrac{(2)^3-2(2)^2}{10(2)^2-29(2)+10} = \dfrac{0}{-8} = 0$ (M)

$x=3, \dfrac{(3)^3-2(3)^2}{10(3)^2-29(3)+10} = \dfrac{9}{13}$ (M)

$x=2,4, \dfrac{(2,4)^3-2(2,4)^2}{10(2,4)^2-29(2,4)+10} = -\dfrac{149}{125}$ (TM)

$x=0,2, \dfrac{(0,2)^3-2(0,2)^2}{10(0,2)^2-29(0,2)+10} = -\dfrac{9}{575}$ (TM)
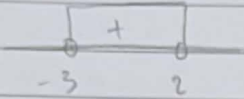
$x \in [0,0] \cup [\frac{2}{5}, 2]$

$\cup (\frac{5}{2}, \infty)$

## LATIHAN 1.1

**15. J)** $\dfrac{x+1}{2-x} \geq \dfrac{x}{x+3}$

$2-x=0 \qquad x+3=0$

$x=2 \qquad x=-3$



$-3 \qquad 2$

$x=0, \quad \dfrac{0+1}{2-0} \geq \dfrac{0}{0+3} \to \dfrac{1}{2} \geq \dfrac{0}{3}$ (M)

$x=-9, \quad \dfrac{-9+1}{2-(-9)} \geq \dfrac{-9}{-9+3} \to \dfrac{-3}{6} \geq \dfrac{-9}{-1}$ (TM)

$x=3, \quad \dfrac{3+1}{2-3} \geq \dfrac{3}{3+3} \to \dfrac{9}{-1} \geq \dfrac{3}{6}$ (TM)

$Hp = \{x \mid -3 < x < 2, x \in R\}$

$x \in (-3, 2)$

---

**K)** $2x+1 \leq x^3 \leq 2x+9$

$x=0, \quad 2\cdot0+1 \leq 0^3 \leq 2\cdot0+9$ (TM)

$x=1, \quad 2\cdot1+1 \leq 1^3 \leq 2\cdot1+9$ (TM)

$x=-1, \quad 2\cdot-1+1 \leq -1^3 \leq 2\cdot-1+9$ (M)

$x=2, \quad 2\cdot2+1 \leq 2^3 \leq 2\cdot2+9$ (M)

$x=-2, \quad 2\cdot-2+1 \leq -2^3 \leq 2\cdot-2+9$ (TM)

$x=3, \quad 2\cdot3+1 \leq 3^3 \leq 2\cdot3+9$ (TM)

$x=-3, \quad 2\cdot-3+1 \leq -3^3 \leq 2\cdot-3+9$ (TM)

$\Rightarrow x=-1$ atau $x=2$

---

**16. b)** $\dfrac{1}{x-5} \geq 3$

$= \dfrac{1}{x-5} - 3 \geq 0$

$= \dfrac{1-3(x-5)}{x-5} \geq 0$

$= \dfrac{-3x+16}{x-5} \geq 0$

$x=0, \quad \dfrac{1}{0-5} \geq 3$ (TM)

$x=16, \quad \dfrac{1}{\frac{16}{3}-5} = \dfrac{1}{\frac{1}{3}} \geq 3$ (M)
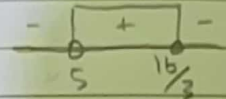
$x=6, \quad \dfrac{1}{6} \geq 3$ (TM)

$Hp = \{x \mid 5 < x \leq \frac{16}{3}, x \in R\}$

Interval $= (5, \frac{16}{3}]$

$x-5=0 \qquad -3x+16=0$

$x=5 \qquad -3x=-16$

$x=\frac{16}{3}$



$5 \qquad \frac{16}{3}$

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## LATIHAN 1.2

3. b). 1. $2x^2 - 3x = x(2x-3)$
$2x^2 - 3x = 2x^2 - 3x$

2. $2x^2 - 3x = x(-2x+3)$
$2x^2 - 3x = -2x^2 + 3x$
$4x^2 - 6x = 0$
$2x^2 - 3x = 0$
$2x(x-3) = 0$
$x = 0 \lor x = 3$

3. $-2x^2 + 3x = x(2x-3)$
$-2x^2 + 3x = 2x^2 - 3x$
$-4x^2 + 6x = 0$

4. $-2x^2 + 3x = x(-2x+3)$
$-2x^2 + 3x = -2x^2 + 3x$ (TM)
$x = 0 \lor x = 3$

e). $\sqrt{(x-7)^2} = x - 7$
$x = 1, \sqrt{(1-7)^2} = 1 - 7$
$6 = 6$ (M)
$x = -1, \sqrt{(-1-7)^2} = -1 - 7$
$8 = 8$ (M)

$x \in R$ memenuhi persamaan

7. $3 \le |x-2| \le 7$
1. $3 \le x - 2 \le 7$
$5 \le x \le 9$

2. $-7 \le x - 2 \le -3$
$-5 \le x \le -1$
$-5 \le x \le -1$ atau $5 \le x \le 9$
Interval $= [-5,-1] \cup [5,9]$

9. b) $\dfrac{1}{|3x-2|} \le 1$

1. $\dfrac{1}{3x-2} \le 1$, $3x-2 > 0 \Rightarrow x > \dfrac{2}{3}$

2. $\dfrac{1}{-3x+2} \le 1$, $-3x+2 > 0 \Rightarrow x < \dfrac{2}{3}$

$x > \dfrac{2}{3}$ atau $x < \dfrac{2}{3}$

Interval $= \left(-\infty, \dfrac{2}{3}\right) \cup \left(\dfrac{2}{3}, \infty\right)$

9. e) $\left|\dfrac{x+2}{1-x} \le 3\right|$

1. $\dfrac{x+2}{1-x} \le 3$    $\Rightarrow \dfrac{x+2 - 3(1-x)}{1-x} \le 0$

$= \dfrac{x+2-3}{1-x} \le 0$   $= \dfrac{x+2-3+3x}{1-x} \le 0$

$\Rightarrow \dfrac{4x-1}{1-x} \le 0$

2. $\dfrac{x+2}{1-x} \le 3$    $x+2 \le 3(1-x)$
$x+2 \le 3 - 3x$
$4x - 1 \le 0$
$x \le \frac{1}{4}$

3. $-\dfrac{x+2}{1-x} \le 3$   $\Rightarrow x+2 \ge -3(1-x)$
$= x+2 \ge -3+3x$
$= -2x \ge -5$
$= x \le \dfrac{5}{2}$

$x \le \dfrac{1}{4}$ dan $x \le \dfrac{5}{2}$

diambil terkecil   $x \le \dfrac{1}{4}$

Interval $= \left(-\infty, \dfrac{1}{4}\right]$

f). $1 \le |x-7| \le 3$    1. $1 \le x - 7 \le 3$
                      $8 \le x \le 11$

$\Rightarrow 4 \le x \le 6$ atau $8 \le x \le 11$   2. $-1 \le x - 7 \le -3$
                            $6 \le x \le 4$

Interval $= [4,6] \cup [8,11]$

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LATIHAN 1.2

**9. k).** $|25-x^2| < 5|5-x|$

1. $25-x^2 < 3(5-x)$

$25-x^2 < 15-3x$

$x^2-3x-10 < 0$

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

$x = 5 \cup x = -2$

2. $25-x^2 \leq 3(x-5)$

$= 25-x^2 < 3x-15$

$= x^2+3x-40 < 0$

$(x-5)(x+8)$

$x = 5 \cup x = -8$

$$\underset{-8 \quad\quad -2 \quad\quad\quad 5}{- \boxed{\quad + \quad} \quad\quad -}$$
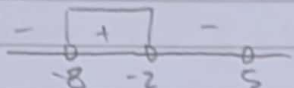
$x = -10, = |25-(-10)^2| < 3|5+10|$

$= 25-100 < 15+30$

$= -75 \quad < \quad$ (TM)

$x = -5, = |25-(-5)^2| < 3|5+5|$

$= 25-25 < 15+15$

$0 \quad < \quad 30$ (M)

$x = 0, = |25-(0)^2| < 3|5-0|$

$= 25 \quad < 15$ (TM)

$x = 6, = |25-6^2| < 3|5-6|$

$= 25-36 < 15-18$

$= -11 \quad < -3$ (TM)

HP $= (-8, -2)$

**16. c).** $\dfrac{7}{|2x-1|} \geq 3$

1. $\dfrac{7}{2x-1} \geq 3$

$= \dfrac{7-3(2x-1)}{2x-1} \geq 0$

$= \dfrac{7+3-6x}{2x-1}$

$= \dfrac{10-6x}{2x-1}$

3. $\dfrac{7}{-2x+1} \geq 3$

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

$6x+4 \geq 0$

$6x \geq -4$

$x \geq -\dfrac{4}{6}, = \dfrac{-2}{3}$

2. $\dfrac{7}{2x-1} \geq 3$

$7 \geq 3(2x-1)$

$7 \geq 6x-3$

$6x-10 \leq 0$
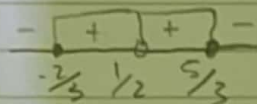
$6x \leq 10$

$x \leq \dfrac{10}{6}, \dfrac{5}{3}$

4. $2x-1 \neq 0$

$x \neq \dfrac{1}{2}$

$$\underset{-\frac{2}{3} \quad\quad \frac{1}{2} \quad\quad \frac{5}{3}}{- \boxed{\quad + \quad} \boxed{+} \quad -}$$

HP $= \left[-\dfrac{2}{3}, \dfrac{1}{2}\right] \cup \left[\dfrac{1}{2}, \dfrac{5}{3}\right]$