

1. Dapatkan penyelesaian dan ps. bentuk:

a.  $2|x^2-1| = 0$

$$|x^2-1| = \begin{cases} x^2-1, & x^2-1 \geq 0 \\ -x^2+1, & x^2-1 < 0 \end{cases}$$

$$2|x^2-1| = 0 \Rightarrow |x^2-1| = 0 \quad \text{diket: } \sqrt{x^2} = |x|$$

$$\Rightarrow \frac{|x^2-1|}{2} = 0 \quad \text{diket: } \frac{(\sqrt{x^2})^2}{2} = \frac{x^2}{2}$$

$$(\sqrt{x^2-1})^2 = (0)^2$$

$$(x^2-1)^2 = 0^2 \Rightarrow x^2-1 = \pm 0$$

$$(x^2-1)^2 - 0^2 = 0, \text{ diket: } a^2 - b^2 = (a+b)(a-b)$$

$$(x^2-1-0)(x^2-1+0) = 0 \Rightarrow \underbrace{(x^2-1)}_a - \underbrace{0}_b = (x^2-1-0)(x^2-1+0)$$

$$\Rightarrow x^2 = 1 \vee x^2 = -1$$

$$\therefore x = \pm 1 \vee x = \pm \sqrt{-1} (\text{TM})$$

$$\therefore H_p = \{x = \pm 1\}$$

13. Diberikan  $(f \circ g \circ h)(x)$

$= \sqrt{\frac{x-1}{2x(x-1)}}$ , dapatkan fungsi-fungsi  $f, g$ , dan  $h$ .

$$f(g(h(x)))$$

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

$$g(x) = \sqrt{x}$$

$$f(x) = x$$

$$f(g(h(x))) = f\left(g\left(\frac{x-1}{2x(x-1)}\right)\right)$$

$$= f\left(\sqrt{\frac{x-1}{2x(x-1)}}\right)$$

$$\begin{array}{ll} x = 3 & x = -3 \\ x^2 = 9 & x^2 = 9 \\ x^2 = 9 & \end{array}$$

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3. a.

$$\frac{x+6}{x^2-1} \leq 0$$

$$\frac{x+6}{(x-1)(x+1)} \leq 0$$

$$\frac{x+6}{x^2-1} \leq 0$$

Pembuat nol:

$$\frac{-6x^2+x+12}{(3x+4)(2x+3)} \leq 0$$

$$\frac{(x-1)(x+1)}{(3x+4)(2x+3)} \leq 0$$

Pembilang:

$$3x+4=0$$

$$\rightarrow x=-\frac{4}{3}$$

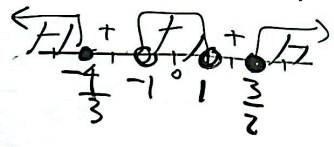
$$-2x+3=0$$

$$\rightarrow x=\frac{3}{2}$$

Penyebut:

$$x-1 \neq 0 \quad x+1 \neq 0$$

$$x \neq 1 \quad x \neq -1$$



2. Tentukan k:

a.  $y=kx+2$  // garis  $3x-4y=5$

$$m = -\frac{3}{-4} = \frac{3}{4}$$

pers.  $ax+by+c=0$

$$m = -\frac{a}{b}$$

misal: melalui titik  $b_2$

$(1,0)$  dan  $(3,7)$   $\perp$

garis  $2x+5y-3=0$

$$m_p = -\frac{2}{5}$$

misal:  $(a_1, b_1)$  dan  $(a_2, b_2)$

$$m = \frac{b_2 - b_1}{a_2 - a_1}$$

$$m = \frac{7-0}{3-1} = \frac{7}{2}$$

$m \cdot m_p = -1$

$$\frac{7}{3-k} \cdot \frac{2}{5} = -1 \rightarrow \frac{7}{3-k} = -\frac{5}{2} \rightarrow 14 = 15-5k$$

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b.  $\sqrt{x^2 - 6x + 9} = 12 \Leftrightarrow |x-3| = 12$

$x^2 - 6x + 9 = 12^2$

$x^2 - 6x + 9 - 144 = 0$

$x^2 - 6x + 9 - 144 = 0$

$x^2 - 6x = 135 = 0$

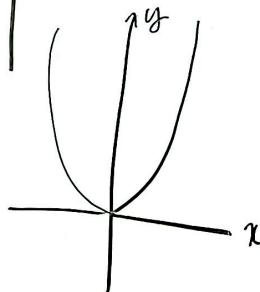
$(x-15)(x+9) = 0$

$x = 15 \vee x = -9$

$\therefore Hp = \{15, -9\}$

$(x-3)^2 - 12^2 = 0 \Leftrightarrow (x-3-12)(x-3+12) = 0$   
 $(x-15)(x+9) = 0$

	135
5	27
-15	+9



c. Gambur grafik

$y = |3x-3|$

$y = 3|x-1|$

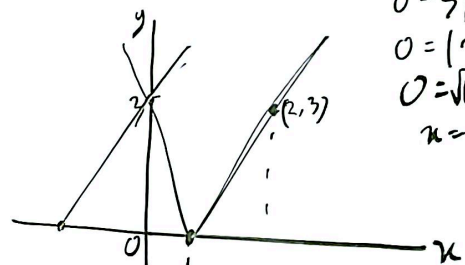
x	0	1	2
y	3	0	3

$y = 3|x-1| \rightarrow y = 3|x-1|$

$0 = 3|x-1|$

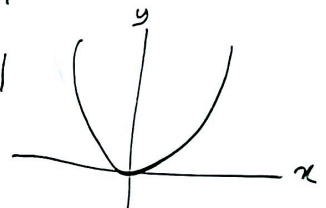
$0 = |x-1|$

$x = 1$



$y = |x^2|$

$y = |x^3|$





$$3. a. \frac{x+6}{x^2-1} \leq 6$$

$$\frac{x+6}{x^2-1} - 6 \leq 0$$

$$\frac{x+6}{x^2-1} - \frac{6(x^2-1)}{x^2-1} \leq 0$$

$$\frac{x+6-6x^2+6}{x^2-1} \leq 0$$

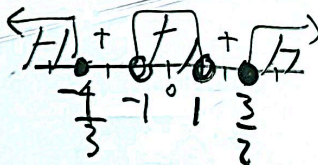
Pembuat nol:

$$\frac{-6x^2+x+12}{x^2-1} = 0$$

$$\frac{(3x+4)(2x+3)}{(x-1)(x+1)} = 0$$

Pembuat nol:

$$\begin{aligned} x-1 &\neq 0 & x+1 &\neq 0 \\ x &\neq 1 & x &\neq -1 \end{aligned}$$



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$$3b. \sqrt{x^2-3x+6} \geq 3$$

$$x^2-3x+6 \geq 9$$

$$x^2-3x+6-9 \geq 0$$

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

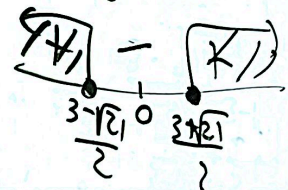
$$x_{1,2} = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

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

$$= \frac{3 \pm \sqrt{21}}{2}$$

$$x_1 = \frac{3+\sqrt{21}}{2}$$

$$x_2 = \frac{3-\sqrt{21}}{2}$$





$$\boxed{Dg = R_{g^{-1}}}$$

$$R_g = D_{g^{-1}}$$

$$D_{g \circ f} = D_g$$

$$g^{-1}(u) = \dots$$

$$g(u) = \sqrt{u}$$

$$f(u) = 4 - u^2$$

$$D_{g \circ f} = ?$$

$$D_{g \circ f} = \{u \in D_f : f(u) \in D_g\}$$

$$= \{u \in \mathbb{R} : 4 - u^2 \in [0, +\infty)\}$$

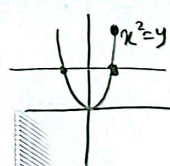
Catatan:  $4 - u^2 \geq 0$

$$4 \geq u^2$$

$$u \leq 2$$

$$\therefore D_{g \circ f} = \{u \in \mathbb{R} : u \in (-2, 2]\}$$

$$= \{u \in (-2, 2]\}$$



$$g(u) = 3 - u ; D_g = \{u \geq 0\}$$

$$f(u) = \sqrt{4 - u^2}$$

$$h(u) = (f \circ f)(u)$$

$$D_h = ?$$

$$D_f = \{4 - u^2 \geq 0\}$$

$$= \{(2 - u)(2 + u) \geq 0\}$$

$$(2 - u)(2 + u) \geq 0$$

Pembuat nol:

$$(2 - u)(2 + u) = 0$$

$$u = 2 \vee u = -2$$



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$$D_f = \{u \leq -2 \vee u \geq 2\}$$

$$D(g \circ f) = \{u \in D_f : f(u) \in D_g\}$$

$$= \{u \in (-\infty, -2] \cup [2, +\infty) : \sqrt{4 - u^2} \in [0, +\infty)\}$$

Catatan:  $\sqrt{4 - u^2} \geq 0$

$$= \{u \in (-\infty, -2] \cup [2, +\infty)\}$$