Soal latihan

17 September 2015 16:43

Kalau Anda ingin menyelesaikan pertidaksamaan

$$\frac{2x-1}{x+2} \le 3 \rightarrow \frac{2x-1}{x+2} - 3 \le 0 \rightarrow \frac{2x-1}{x+2} - \frac{3(x+2)}{x+2} \le 0$$

$$\frac{2x-1}{x+2} - \frac{3x+6}{x+2} \le 0 \rightarrow \frac{2x-1-(3x+6)}{x+2} \le 0 \rightarrow \frac{2x-1-3x-6}{x+2} \le 0$$

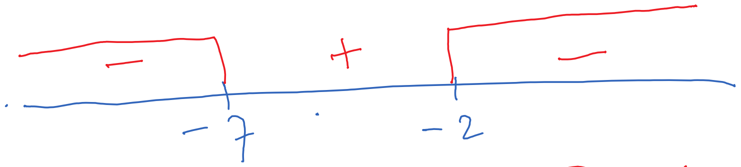
$$\frac{\cancel{2x}\ \boxed{-}x-7}{\boxed{\ }x+2} \le 0$$

neg

pos

pembilang, $-x-7=0 \Rightarrow x=-7$

penyebut, $x+2=0 \Rightarrow x=-2$



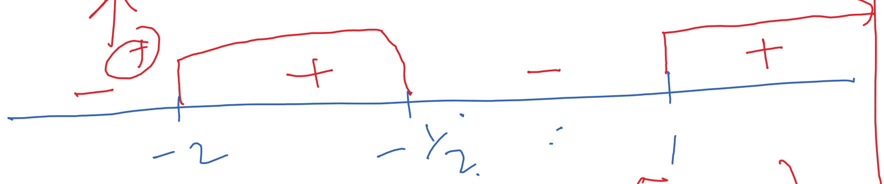
Solusinya, $(-\infty,-7] \cup (-2,\infty)$

$$\frac{(x+2)(x-1)}{2x+1} \ge 0$$

(+) (+) (+)

$x=-2,\ x=1$

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



Solusinya: $[-2,-\frac{1}{2}) \cup [1,\infty)$

$\circ)\ \le$

$\circ)\ \ge$

Pembilang itu harus ikut

$\circ)\ >$ atau $<$

tidak ada yg ikut

$$\left|\frac{x+1}{x}\right| < 2$$

sifat yg dipakai $|x|<a \Leftrightarrow -a<x<a$

$$-2 < \frac{x+1}{x} < 2 \Leftrightarrow -2 < \frac{x+1}{x} \text{ dan } \frac{x+1}{x} < 2$$

$$0 < 2 + \frac{x+1}{x} \text{ dan } \frac{x+1}{x} - 2 < 0$$

$0 < \frac{2x}{x} + \frac{x+1}{x}$ dan $\frac{x+1}{x} - \frac{2x}{x} < 0$

$0 < \frac{2x + x + 1}{x}$ dan $\frac{x+1-2x}{x} < 0$

$3x+1=0$
$x = -\frac{1}{3}$

$0 < \frac{\boxed{3x+1}}{x}$ dan $\frac{\boxed{-x+1}}{x} < 0$

$+ \quad -\frac{1}{3} \quad - \quad 0 \quad +$ dan $- \quad 0 \quad + \quad 1 \quad -$

$(-\infty, -\frac{1}{3}) \cup (0, \infty)$ dan $(-\infty, 0) \cup (1, \infty)$

diiriskan

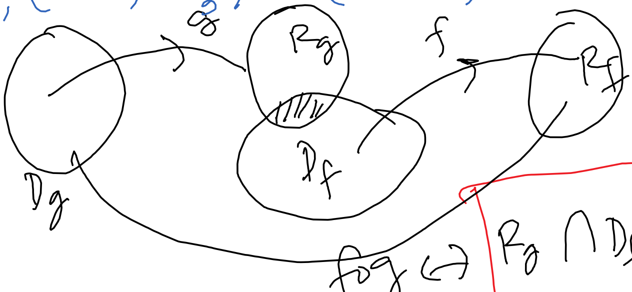
diiriskan

$0 \qquad 1$

solusi, $(-\infty, -\frac{1}{3}) \cup (1, \infty)$

$\left|\frac{x+1}{x}\right| > 2$

$\boxed{f \circ g} \rightarrow$



$f \circ g \Leftrightarrow \boxed{R_g \cap D_f \neq \emptyset}$

$\boxed{g \circ f} \rightarrow$ syaratnya, $R_f \cap D_g \neq \emptyset$

$f \circ g$ terdefinisi, syaratnya $R_g \cap D_f \neq \emptyset$
$g \circ f$ terdefinisi, syaratnya $R_f \cap D_g \neq \emptyset$

Fungsi Kontinu $\Longleftrightarrow$ $f(x)$ dikatakan kontinu di $x = a$ bila dipenuhi syarat $f(a) = \boxed{\lim_{x \to a} f(x)}$

$f(x)$ terdefinisi di $x = a$

Contoh: $f(x) = \begin{cases} x^2+1, & \boxed{x \le 2} \\ 5x, & x > 2 \end{cases}$

Apakah $f(x)$ kontinu di $x = 2$?

1) $f(2) = 5$, $\lim_{x \to 2^-} f(x) = \lim_{x \to 2^-} (x^2+1) = 5$?

lim f(x) Ada

1) $f(2) = 5$? $\lim\limits_{x\to 2^-} f(x) = \lim\limits_{x \to 2^-} (x^2+1) = 5$

2) $\lim\limits_{x\to 2} f(x)$ ~~Ada~~ $\lim\limits_{x\to 2^+} f(x) = \lim\limits_{x\to 2^+} (5x) = 10$ } $\neq$

3) $f(2) = \lim\limits_{x\to 2} f(x)$

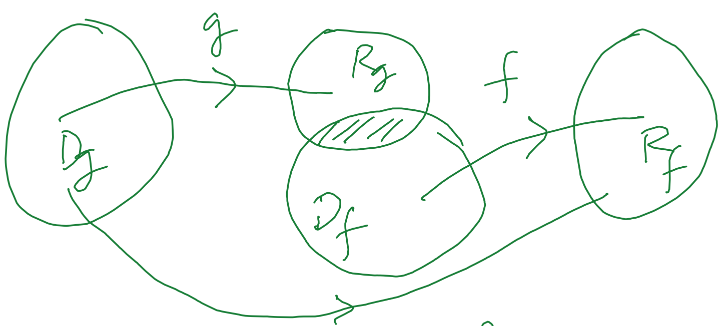
$\lim\limits_{x\to 2} f(x)$ tidak ada ✓

jadi $\boxed{f(x) \text{ diskontinu di } x=2}$

$\lim\limits_{x\to a} f(x)$ Ada

$\Updownarrow$

$\lim\limits_{x\to a^+} f(x) = \lim\limits_{x\to a^-} f(x)$



$f \circ g \to$ bagaimana cara mencari domain $f \circ g$?

$\boxed{D_{f\circ g} \subseteq D_g}$ $\boxed{D_{g\circ f} \subseteq D_f}$

Apakah $f(x) = \begin{cases} x+2, & x \le 1 \\ x^2+2, & x > 1 \end{cases}$ Kontinu ?

garis $\to$ $x+2$

parabola $\leftarrow$ x^2+2

yg patut dicurigai itu di $x = 1$

$(f\circ g)(x) = \dfrac{\sqrt{x-1}}{\sqrt{x-1}+1} \to D_{f\circ g} = ? \longrightarrow f(x) = ? \to D_f, R_f$

$g(x) = ? \to \boxed{D_g}, R_g$

$\Downarrow$

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

Domain dr $y = \dfrac{\sqrt{x-1}}{\sqrt{x-1}+1} \to D_y = ? \to y \in R$

$\sqrt{x-1} \in R$

$x - 1 \geq 0$

$\boxed{D_y = [1, \infty)}$

$\boxed{D_g = [1, \infty)}$

Bagaimana ~~dg~~ domain D_{fog}? $\quad x - 1 \geq 0$ $\quad \boxed{x \geq 1}$ ← diiriskan

Misal $D_g = [10, \infty) \cup (-\infty, 0)$

Maka $D_{fog} = [10, \infty)$

diiriskan

$g(x) = \sqrt{x-1} \rightarrow D_g = [1, \infty) \rightarrow D_{fog} = [1, \infty)$

$\sqrt{x-1} \in R$

$x - 1 \geq 0$