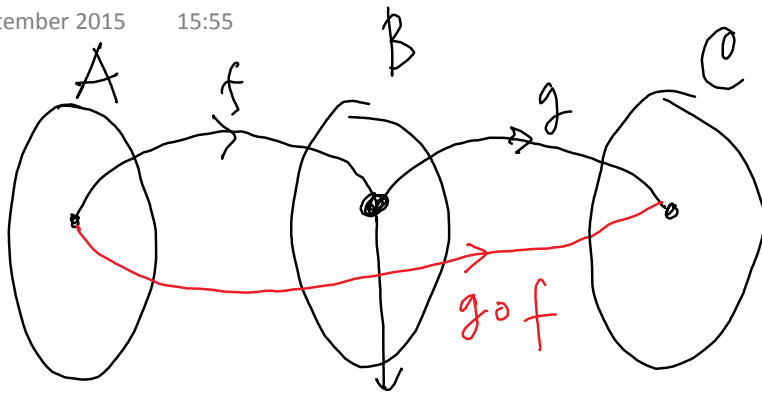
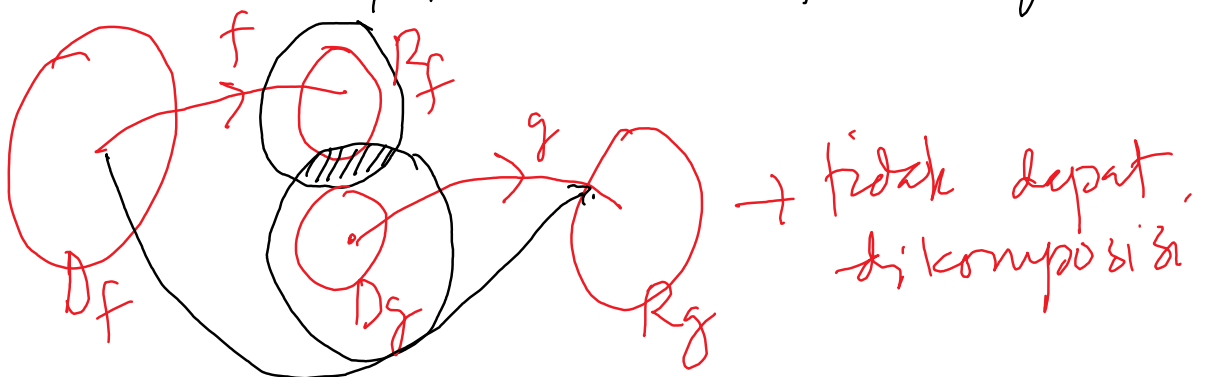


# Fungsi Komposisi

09 September 2015 15:55



termuat dalam  $R_f$  dan  $D_g$

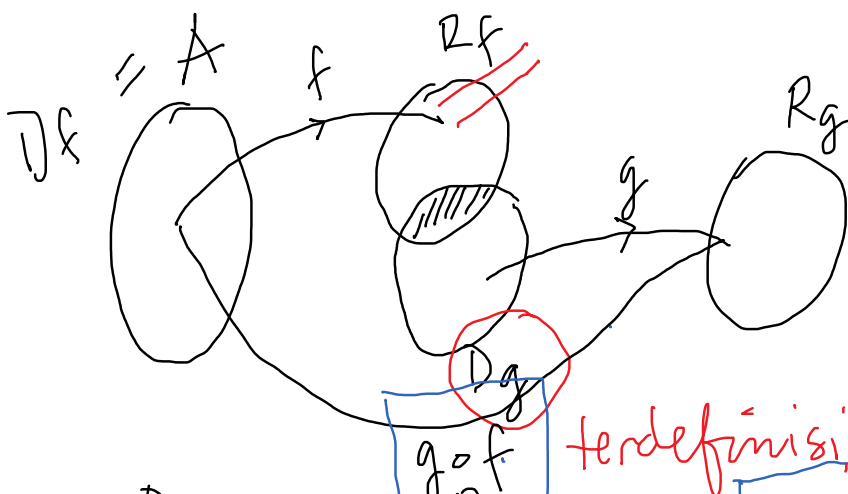


Agar terjadi komposisi  $g \circ f$ , syaratnya

$$R_f \cap D_g \neq \emptyset$$

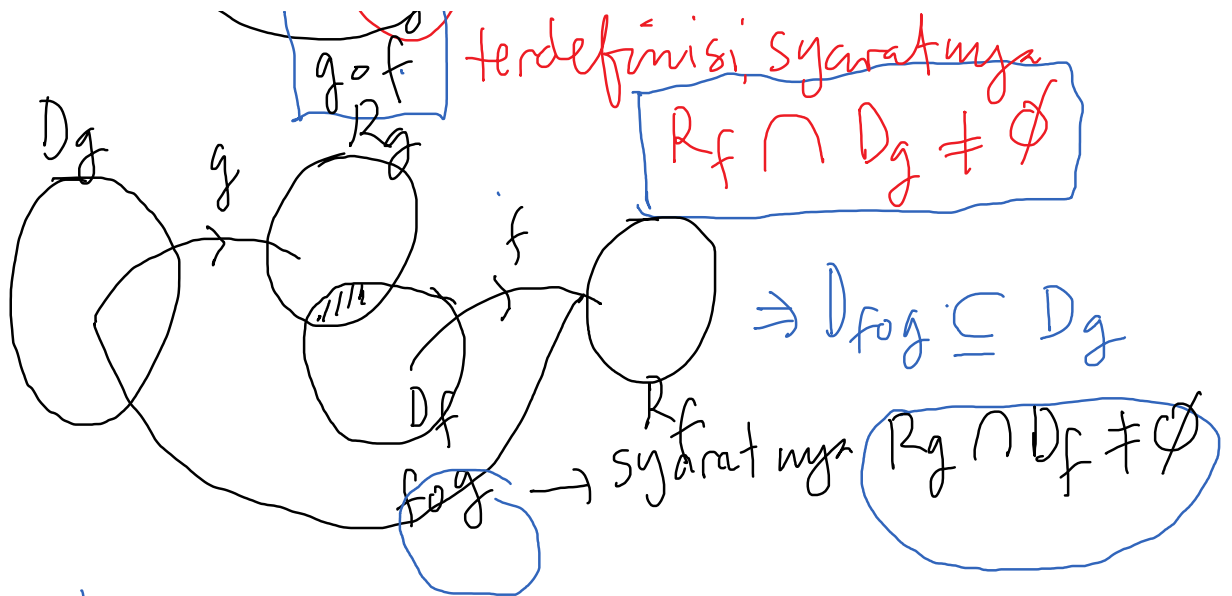
Agar terjadi komposisi  $f \circ g$ , syaratnya

$$R_g \cap D_f \neq \emptyset$$



himpunan bagian

$$\Rightarrow D_{g \circ f} \subseteq D_f$$



Contoh

$f(x) = \sqrt{1-x}$  ,  $D_f$  ,  $R_f$

$g(x) = \frac{x}{1-x}$  ,  $D_g$  ,  $R_g$

$f(x) \in \mathbb{R} \Rightarrow \sqrt{1-x} \in \mathbb{R} \Rightarrow 1-x \geq 0 \Rightarrow x \leq 1$

$D_f = \{x \mid x \leq 1\} = (-\infty, 1]$

$x \in D_f \Rightarrow f(x) \geq 0 \Rightarrow R_f = \{y \mid y \geq 0\} = [0, \infty)$

$g(x) \in \mathbb{R} \Rightarrow \frac{x}{1-x} \in \mathbb{R} \Rightarrow 1-x \neq 0 \Rightarrow x \neq 1$

$D_g = \{x \mid x \neq 1\} = (-\infty, 1) \cup (1, \infty)$

$g(x) = 1 \Rightarrow x = ?$

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

$g(x) = -1 \Rightarrow x = ?$

$\frac{x}{1-x} = -1$  tidak ada nilai  $x$   
 $x = -1 + x$   
 $0 = -1$

$1-x \overline{\left[ \begin{array}{r} x \\ -1+x \end{array} \right]} \Rightarrow \frac{x}{1-x} = -1 + \frac{1}{1-x}$

$$\frac{1-x}{1-x} \cdot \frac{x}{-1+x} \Rightarrow \frac{x}{1-x} = -1 + \frac{1}{1-x}$$

$$8 \sqrt{\frac{11}{8}} \Rightarrow \frac{11}{8} = 1 + \frac{3}{8}$$

$$g(x) = \frac{x^3}{1-x} = -1 + \frac{1}{1-x}, \text{ sebab } \frac{1}{1-x} \neq 0$$

$$\text{malca } g(x) \neq -1$$

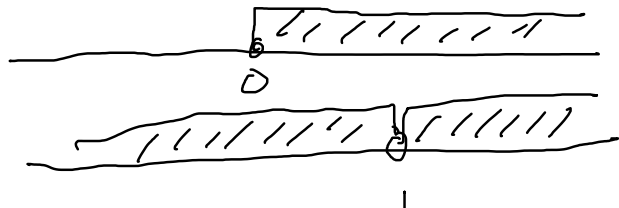
$$\square = \text{apple} + \cancel{\text{apple}} \Rightarrow \square = \text{apple}$$

$$R_g = \{y \mid y \neq -1\} = \cancel{(-\infty, -1) \cup (-1, \infty)}$$

Apakah  $g \circ f$  terdefinisi?  $\Rightarrow$  syarat:  $R_f \cap D_g \neq \emptyset$

$$R_f = [0, \infty)$$

$$D_g = (-\infty, 1) \cup (1, \infty)$$



Sebab  $R_f \cap D_g = [0, 1) \cup (1, \infty)$ , maka  $g \circ f$  terdefinisi

Bagaimana rumusan fungsi  $(g \circ f)(x) = ?$

$$\begin{aligned} f(x) &= \sqrt{1-x} \\ g(x) &= \frac{x}{1-x} \end{aligned} \Rightarrow (g \circ f)(x) = g(f(x)) = g(\sqrt{1-x}) = \frac{\sqrt{1-x}}{1-\sqrt{1-x}}$$

Bagaimana cara mencari domain dr  
 $h(x) = (g \circ f)(x) = \frac{\sqrt{1-x}}{1-\sqrt{1-x}} \Rightarrow D_h = ?$

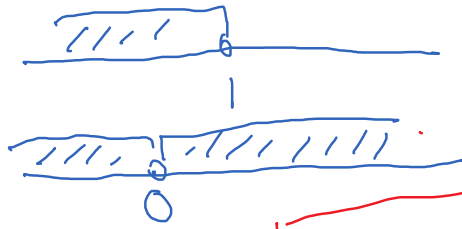
100)

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

$$D_{g \circ f} \subseteq D_f \Rightarrow D_h \subseteq D_f$$

$$h(x) \in \mathbb{R} \Rightarrow \frac{\sqrt{1-x}}{1-\sqrt{1-x}} \in \mathbb{R} \Rightarrow \sqrt{1-x} \in \mathbb{R} \Rightarrow 1-x \geq 0 \Rightarrow x \leq 1$$

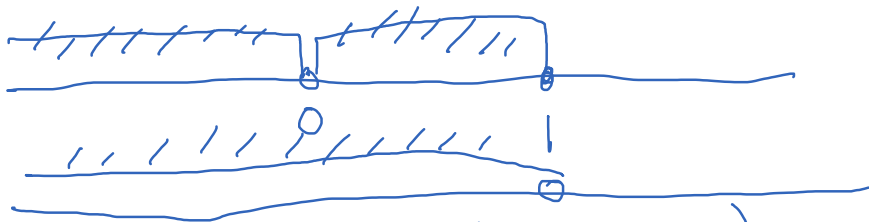
$$1 - \sqrt{1-x} \neq 0 \Rightarrow 1 \neq \sqrt{1-x} \\ 1 \neq 1-x \\ x \neq 0$$



$$\text{Irisannya} = (-\infty, 0) \cup (0, 1] \text{, apakah ini domain } h(x) \text{?}$$

$$D_f = (-\infty, 1)$$

Cara mencari domain  $h(x)$ , yaitu irisan dari:  $(-\infty, 0) \cup (0, 1]$  dan  $D_f = (-\infty, 1)$



$$\text{Jadi } D_h = (-\infty, 0) \cup (0, 1]$$