NOME: FELIPE ANCHIETA DO CUNHA MENDES
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FUNÇÃO COMPOSTA

$$\begin{cases} h(x) = \sqrt[2]{x^3+2} \\ f(x) = \sqrt[2]{x} \\ g(x) = x^3+2 \end{cases}$$

$f(x) = \sqrt[2]{x}$
$f(2) = \sqrt[2]{2}$
$f(4) = \sqrt[2]{4} = 2$
$f(*) = \sqrt[2]{*}$

$f(g(x)) = \sqrt[2]{x^3+2} = h(x)$

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

$f(x)$ e $g(x)$
$Dom(f) \cap Im(g) \neq \emptyset$
$h(x) = f(g(x)) = (f \circ g)(x)$
$Dom(h) = Dom(f) \cap Im(g)$

h é a FUNÇÃO COMPOSTA DE f COM g

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$f: \mathbb{R} \to \mathbb{R}$
$x \to f(x) = x^3$

$g: \mathbb{R} \to \mathbb{R}$
$x \to g(x) = x^5 + 1$

$f \circ g(x) = f(g(x)) = f(x^5+1)$

$= (x^5+1)^3$

$g \circ f(x) = g(f(x)) = g(x^3) = (x^3)^5 + 1$

$= x^{15} + 1$

$f:]0, +\infty[\to \mathbb{R}$
$x \to f(x) = \sqrt[2]{x}$

$g:]0, +\infty[\to \mathbb{R}$
$x \to g(x) = -x$

$Dom(f) \cap Im(g)$

$]0, +\infty[\cap]-\infty, 0[= \emptyset$

$f \circ g(x)$ ∄

$Dom(g) \cap Im(f)$

$]0, +\infty[\cap]0, +\infty[=]0, +\infty[$

$\exists \; g \circ f(x) = g(f(x)) = g(\sqrt[2]{x}) = -\sqrt[2]{x}$

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$f(x) = \frac{x^2+1}{2}$ $\quad\quad$ $g(x) = 5^x$

$f \circ g(x) = f(g(x)) = f(5^x) = \frac{(5^x)^2+1}{2}$

$= \frac{5^{2x}+1}{2}$

$g \circ f = g(f(x)) = g\left(\frac{x^2+1}{2}\right)$

$= 5^{\left(\frac{x^2+1}{2}\right)}$

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