

1

$$f, g \quad f(x) = \begin{cases} -x^2, & x < 0 \\ -x + 2, & x \geq 0 \end{cases}$$

$$g \quad \mu .$$

) $\mu .$

) $f(x) = g(x).$

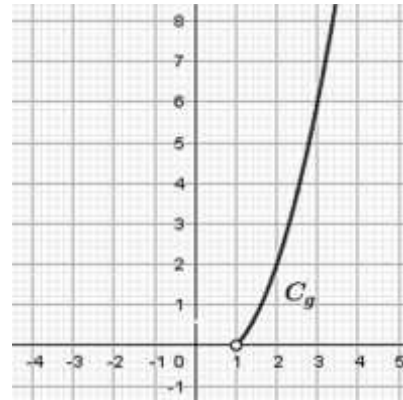
) $f \circ g \quad g$

$f(g(x)) + 10 < g(x) .$

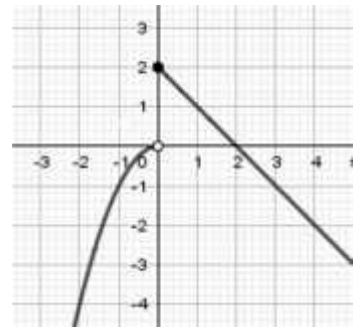
) $h(x) = f(-x) .$

) $\mu \quad \mu \quad f \circ f .$

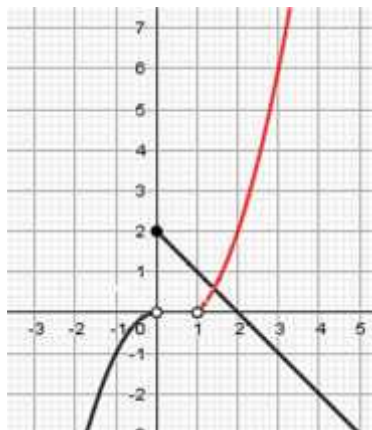
) $f(-g(x)) < -4 .$



$x < 0$ C_f μ μ $x \geq 0$
 μ \cdot
 $x=0$ $f(0)=2$ $x=1$ $f(1)=1,$
 μ μ $(0,2)$ μ
 $(1,1).$ μ μ $x < 0$ $f(x) < 0$
 $x \geq 0$ $f(x) \leq 2,$ μ f
 $f(A) = (-\infty, 2].$



μ C_f, C_g μ \cdot



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μ C_f, C_g μ μ μ \cdot

μ $g(x) > 0$ $x > 1.$
 $f \circ g$ $x \in D_g$ $g(x) \in D_f.$ μ $g(x) > 0,$ $g(x) \in D_f$

$$f(x) = -x + 2, x \geq 0. \quad \begin{cases} x \in D_g \\ g(x) \in D_f \end{cases} \Leftrightarrow \begin{cases} x > 1 \\ g(x) > 0 \end{cases}, \quad D_{f \circ g} = (1, +\infty)$$

$$f(g(x)) = -g(x) + 2.$$

$$f(g(x)) + 10 < g(x) \Leftrightarrow -g(x) + 2 + 10 < g(x) \Leftrightarrow 12 < 2g(x) \Leftrightarrow g(x) > 6 \quad (1)$$

$$\mu \quad (3,6), \quad g(3) = 6. \quad (1) \quad : g(x) > 6 \Leftrightarrow g(x) > g(3) \stackrel{g'}{\Leftrightarrow} x > 3.$$

$x > 0$ $-x < 0$ $f(-x) = -(-x)^2 = -x^2.$
 $x < 0$ $-x > 0$ $f(-x) = -(-x) + 2 = x + 2.$

$$x=0 \quad f(0)=2. \quad f(-x) = \begin{cases} -x^2, & x < 0 \\ 2, & x = 0 \\ x+2, & x > 0 \end{cases}$$

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$x < 0$ $f \nearrow$ $x_1 < x_2 < 0$

$$f(x_1) < f(x_2) < 0 \stackrel{f \nearrow (-\infty, 0)}{\Leftrightarrow} f(f(x_1)) < f(f(x_2)) \Rightarrow f \circ f \nearrow (-\infty, 0)$$

$x > 0$ $f \searrow$ $x \in (0, 2)$ $f(x) > 0$ $x > 2$ $f(x) < 0.$

$$0 < x_1 < x_2 < 2 \quad f(x_1) > f(x_2) > 0 \stackrel{f \searrow}{\Leftrightarrow} f(f(x_1)) < f(f(x_2)) \Rightarrow f \circ f \nearrow (0, 2).$$

$$2 < x_1 < x_2 \quad 0 > f(x_1) > f(x_2) \stackrel{f \nearrow (-\infty, 0)}{\Leftrightarrow} f(f(x_1)) > f(f(x_2)) \Rightarrow f \circ f \searrow (2, +\infty).$$

$$) \quad g(x) > 0, \quad -g(x) < 0 \quad x > 1, \quad f(-g(x)) = -g^2(x) \quad :$$

$$f(-g(x)) < -4 \Leftrightarrow -g^2(x) < -4 \Leftrightarrow g^2(x) > 4 \stackrel{g(x) > 0}{\Leftrightarrow} g(x) > 2 \Leftrightarrow g(x) > g(2) \stackrel{g \nearrow}{\Leftrightarrow} x > 2$$

