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[I can't delete this otherwise it comes error] What are domains of following functions?
$(1) y = \sin\sqrt{x}$
$(2) y = \arcsin(x-3)$
$(3) y = \sqrt{3-x} + \arctan\frac{1}{x}$
$(1) x \subset [0, +\infty)$
$(2) x \subset [2, 4]$
$(3) x \subset (-\infty, 3] \setminus \{0\}$
[2 Marks] Let
$$\mathrm{f(x)} = \begin{cases} 1 \mathrm{for} |x| < 1 \\ 0 \mathrm{for} |x| = 1 \\ -1 \mathrm{for} |x| > 1 \end{cases}, g(x) = e^x,$$
and answer following questions: What are $f[g(x)]$ and $g[f(x)]$? Draw graphics of them.
$$f[g(x)] = \begin{cases} 1 \mathrm{for} x < 0 \\ 0 \mathrm{for} x = 0 \\ -1 \mathrm{for} x > 0 \end{cases},$$
$$g[f(x)] = \begin{cases} e \mathrm{for} -1 < x < 1 \\ 1 \mathrm{for} x = \pm 1 \\ e^{-1} \mathrm{for} x < -1 \text{ or } x > 1 \end{cases}$$
I have not learnt to draw with LaTex yet, so I draw them by hands.