HONS 280–01 (Kunkle), Quiz 2 | Name: ______________________________
10 pts, 10 minutes | Sept 3, 2026

1(10 pts). Let

$$f(x) = \sqrt{2-x} \qquad g(x) = \frac{3}{x^2+4} \qquad h(x) = \begin{cases} x+1 & \text{if } 1 \le x \\ 1-2x & \text{if } -1 \le x < 1 \end{cases}$$

Find the following.

a. The domain of $f(x)$.

b. The domain of $g(x)$.

c. The domain of $h(x)$.

d. The function $g(f(x))$.

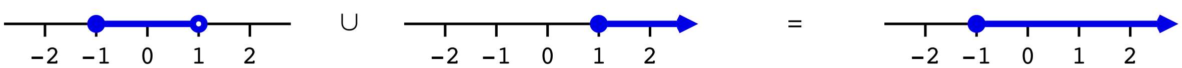
Simplify your answer to part d.

Solution:

1a.(Source: 1.1) The square root is defined only if $0 \le 2-x$, or $x \le 2$. The domain is $(-\infty, 2]$.

1b.(Source: 1.1) $x^2+4=0$ would imply $x^2=-4$. This equaion has no real solutions, so the fraction $g(x)$ is defined for all real numbers x. The domain is $(-\infty, \infty)$.

1c.(Source: 1.1) This piecewise defined function is defined to be $x+1$ for all x in $[1, \infty)$ and $1-2x$ for all x in $[-1, 1)$. The domain is their union, $[-1,1) \cup [1, \infty)$, or, more simply, $[-1, \infty)$. Here's a picture:



1d.(Source: 1.2) We can express the function g as:

$$g(\quad) = \frac{3}{(\quad)^2+4}.$$

Then

$$g(f(x)) = g\left(\sqrt{2-x}\right) = \frac{3}{\left(\sqrt{2-x}\right)^2+4} = \frac{3}{2-x+4} = \frac{3}{6-x}.$$

(done)