1. Suppose $f(x) = x^2 + 1$, and g is a function such that $g(1) = 2$.

(a): What is the value of $f(g(1))$?

Solution: $f(g(1)) = f(2) = 2^2 + 1 = \boxed{5.}$

(b): What is the value of $g(f(0))$?

Solution: $g(f(0)) = g(0^2 + 1) = g(1) = \boxed{2.}$

(c): What is the range of f and why?

Solution: Since $x^2 \geq 0$ for all real x, then $x^2 + 1 \geq 1$ for all real x. So the outputs of x are real numbers which are at least 1. Given any such $y \geq 1$, we have it as an output, since $f(\sqrt{y-1}) = (\sqrt{y-1})^2 + 1 = y - 1 + 1 = y$.

$\boxed{\text{The range is all real } y \geq 1.}$

2. Sketch a graph of $y = 3^x - 2$. Label axes, and label several points on the graph.

Solution:

x	$3^x - 2 = y$
0	$3^0 - 2 = -1$
1	$3^1 - 2 = 1$
2	$3^2 - 2 = 7$
-1	$3^{-1} - 2 = \frac{1}{3} - 2 = -\frac{5}{3}$