Work on these with your partner(s) at the board

1. Let

   $f : \mathbb{Z} \to \mathbb{Z}$ where $f(k) = k + 7$,

   $g : \mathbb{Z} \to \{0, 1, 2, 3, 4\}$ where $g(k) = k + 1 \mod 5$,

   and $h : \{0, 1, 2, 3, 4\} \to \{0, 1, 2, 3, 4\}$ where $h(a) = a^2 \mod 5$

   Determine if the following expressions are defined. If so, find the value.

   $$(g \circ f)(2), \quad (h \circ g)(2), \quad (h \circ f)(4), \quad (h \circ f)(-3), \quad (h \circ g \circ f)(0)$$

2. Let $g : \mathbb{R} \to \mathbb{R}$ be defined by $g(x) = 2x - 7$.

   Prove that g is a bijection. i.e. Prove that g is one-one and onto.