"Ideas..." problems for tutorials week 22

I-22.1. Draw the mapping $g : \mathbb{R} \to \mathbb{R}$ on the (x, y) plane defined by the rule

$g(x) =$ largest integer $\leqslant x$.

Is it injective? surjective?

I-22.2. For the mapping g in Question 1, what is the image of g? what is the full inverse image $g^{-1}(2)$?

I-22.3. Given any mapping $f : A \to B$, prove that the relation $\sim$ on A defined by $a_1 \sim a_2$ if $f(a_1) = f(a_2)$ is an equivalence relation. What are the equivalence classes?