Exercises 0: 11, 14, 16, 17, 19, 20ai

Additional exercises:

1. Let $\phi\colon A \to B$ and $\chi\colon B \to C$ be two maps. Show that:
   (a) If $\chi \circ \phi$ is surjective, then χ must be surjective.
   (b) If $\chi \circ \phi$ is injective, then ϕ must be injective.
2. Determine whether the following maps are invertible.
   (a) $\phi : \mathbb{R} \to \mathbb{R}$, where $\phi(x) = \frac{5+3x}{2}$
   (b) $\phi : \mathbb{R} \to \mathbb{R}$, where $\phi(x) = x^2 - 4$.
3. Let $\phi : A \to B$ and $\chi : B \to C$ be maps. Prove that if ϕ and χ are both surjective, then $\chi \circ \phi$ is surjective.