30. Work on problems 1–8 of Section 2.7 in the textbook.
31. Define a relation on $\mathbb{Z}$ by $m \sim n$ iff 7 divides $m-n$. Show that $\sim$ is an equivalence relation. Find all equivalence classes.
32. Work on problems 1–5, 26, 36, 56, 58, 89–95 of Section 2.8 in the textbook.
33. Let $f, g : \mathbb{N} \to \mathbb{N}$ be defined by $f(n) = n^2$ and $g(n) = 3n+2$. Is f one-to-one, onto, invertible? Find $f(\{8,9,11\})$, $g^{-1}(\{8,9,11\})$, $(g \circ f)(4)$, $(g \circ f)^{-1}(\{13,14\})$, and $\mathcal{P}(f^{-1}([3,10] \cap \mathbb{Z}))$.
34. Let $X = \{x_1, x_2, x_3, x_4\}$, $Y = \{y_1, y_2, y_3, y_4\}$, $Z = \{z_1, z_2, z_3\}$, and define $f : X \to Y$, $g : Y \to Z$, $h : Z \to X$ by $f(x_1) = y_1$, $f(x_2) = y_3$, $f(x_3) = y_4$, $f(x_4) = y_2$, $g(y_1) = z_1$, $g(y_2) = z_1$, $g(y_3) = z_3$, $g(y_4) = z_2$, $h(z_1) = x_1$, $h(z_2) = x_2$, and $h(z_3) = x_4$.
    (a) Find $h \circ g$, $g \circ f$, and $h \circ g \circ f$.
    (b) Find $g(\{y_1, y_3\})$, $h(Z)$, $f^{-1}(\{y_1, y_3\})$, and $h^{-1}(\{x_3, x_4\})$.
    (c) Is f one-to-one, onto, or invertible? How about g and h? Find the inverse functions of whatever functions are invertible.
    (d) Find $(h \circ g \circ f)(X) \cap \{x_2, x_3, x_4\}$, $h^{-1}(X) \cup g(Y)$, $Z \setminus g(Y)$, and $\mathcal{P}(h(Z))$.