

Assignment 4, Discrete Math

Covers sections 3.2, 4.1, 4.2

When calculations are a bit too painful for pen-and-paper, feel free to use a calculator to do basic computations.

1. In class, we showed that the function $f : \mathbb{N} \rightarrow \mathbb{Z}$ below is one-to-one.

$$f(n) = \begin{cases} \frac{n}{2} & \text{if } n \text{ even} \\ \frac{1-n}{2} & \text{if } n \text{ odd} \end{cases}$$

Show that f is onto in the following manner: given any $z \in \mathbb{Z}$, find an $n \in \mathbb{N}$ such that $f(n) = z$. Use this to write the formula for f^{-1} .

2. 3.2 #7(d)
3. Define $f : 2\mathbb{Z} \rightarrow \mathbb{Z}$ by $f(a) = \frac{3a-4}{2}$. Is f one-to-one? Is f onto?
4. 4.1 #4
5. 4.1 #7
6. 4.1 #11(a)
7. 4.2 #9
8. 4.2 #10(b),(e)
9. 4.2 #11
10. 4.2 #12(a),(b),(d)
11. 4.2 #14
12. 4.2 #17(b)
13. 4.2 #30