University of Baltimore
Math 321: Discrete Structures
Worksheet for Chapter 3: Function exercises

1. Given the function $f(n) = 2n + 1$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

2. Given the function $f(n) = n^2 - n$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

3. Given the function $f(n) = \dfrac{n+3}{n!}$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

4. Given the function $f(n) = \begin{cases} n+1, & n \le 2 \\ n-1, & n > 2 \end{cases}$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

5. Given the function $f(n) = \begin{cases} f(0) = 0 \\ f(n) = n^2 - 1, & n \ge 1 \end{cases}$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

6. Given the function $f(n) = \begin{cases} f(0) = 0 \\ f(n) = [f(n-1)]!, & n > 0 \end{cases}$, evaluate $f(0)$, $f(1)$, $f(2)$ and $f(3)$.

7. Given the function $f(n) = \begin{cases} f(0) = 1 \\ f(n+1) = f(n) + 2, & n \ge 0 \end{cases}$, evaluate $f(0)$, $f(1)$, $f(2)$, $f(3)$ & $f(4)$.

8. Given $f(n) = \begin{cases} f(0) = 1 \\ f(1) = 3 \\ f(n+2) = 2\,f(n+1) - f(n), & n \ge 0 \end{cases}$, evaluate $f(0)$, $f(1)$, $f(2)$, $f(3)$ & $f(4)$.

9. Of the functions given above, which ones are recursive functions?

Answers: 1) 1, 3, 5, 7 2) 0, 0, 2, 6 3) 3, 4, $\frac{5}{2}$, 1 4) 1, 0, 3, 2
5) 0, 0, 3, 8 6) 0, 1, 1, 1 7) 1, 3, 5, 7, 9 8) 1, 3, 5, 7, 9