



## 1 Homework Set 5

- 1 Find the least number  $n_0 \geq 1$  for which it is true that  $n! \geq 2^n$ . Taking the case  $n = n_0$  as the induction basis, show that the statement is true for all  $n \geq n_0$ .
- 2 Grimaldi's book (5. ed., Exercises 4.2): solve **Exercise 1 a,c,e**
- 3 Grimaldi's book (5. ed., Exercises 4.2): solve **Exercise 14**
- 4 Grimaldi's book (5. ed., Exercises 4.1): solve **Exercise 15**
- 5 Grimaldi's book (5. ed., Exercises 4.2): solve **Exercise 20**
- 6 Use the alternative principle of induction to show that if  $u_n$  is defined recursively by the rules  $u_1 = 3$ ,  $u_2 = 5$  and for all  $n > 1$

$$u_{n+1} = 3u_n - 2u_{n-1}$$

then  $u_n = 2^n + 1$  for all  $n \in \mathbb{N}$ .