Norwegian University of Science
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MA0301 Elementary discrete mathematics Spring 2017

Exercise set 4

1 Basic exercises

1 Let $Y := \{1, 2, 3, 4, \ldots, 600\}$. Use the inclusion-exclusion principle to find the numbers of positive integers in Y that are not divisibile by 3 or 5 or 7.

2 Grimaldi's book (5. ed., Exercises 4.1): solve **Exercise 1 a,b,c**

3 Grimaldi's book (5. ed., Exercises 4.1): solve **Exercise 27**

4 Use the principle of induction to show that for all natural numbers n, $4\sum_{i=1}^{n} i(i+2)(i+4) = n(n+1)(n+4)(n+5)$.

5 1) Guess a formula for $\sum_{i=1}^{n}(bi+c)$, where b, c are given numbers, and prove it using the principle of induction.

2) Use the well-known result $6\sum_{i=1}^{n} i^2 = n(n+1)(2n+1)$ and the result of 1) to write down a formula for $\sum_{i=1}^{n} ai^2 + bi + c$, where a, b, c are given numbers.