MA0301
ELEMENTARY DISCRETE MATHEMATICS
NTNU, SPRING 2022

SET 10

Deadline: Monday 28.03.2022, 23:59

Exercise 1. *There are 18 mathematics majors and 325 computer science majors at a college.*

  a) In how many ways can two representatives be picked so that one is a mathematics major and the other is a computer science major?

  b) In how many ways can one representative be picked that is either a mathematics major or a computer science major?

Exercise 2. *How many bit strings are there of length 10 that both begin and end with a 1?*

Exercise 3. *Lewis, Zax: Exercise 22.1.*

Exercise 4. *Find the value of each of these quantities:*

  a) $P(6,3)$
  b) $P(6,5)$
  c) $P(8,1)$
  d) $P(8,5)$
  e) $P(8,8)$
  f) $P(10,9)$

Exercise 5. *Find the value of each of these quantities:*

  a) $C(5,1)$
  b) $C(5,3)$
  c) $C(8,4)$
  d) $C(8,8)$
  e) $C(8,0)$
  f) $C(12,6)$

Exercise 6. *In how many ways can a set of five letters be selected from the english alphabet?*

Exercise 7. *In how many ways can we select three students from a group of five students to stand in line for a picture? In how many ways can we arrange all five of these students for a picture?*

Exercise 8. *How many ways are there for four men and five women to stand in a line so that:*

  a) all men stand together?
  b) all women stand together?

Date: March 18, 2022.

Exercise 9. *Lewis, Zax: Exercise 23.1.*

Exercise 10. *A certain ice cream store has 31 flavors of ice cream available. In how many ways can we order a dozen ice cream cones if:*

    a) we do not want the same flavor more than once?
    b) a flavor may be ordered as many as 12 times?

Exercise 11. *Determine the number of integer solutions for $x_1 + x_2 + x_3 + x_4 + x_5 < 40$ where*

    a) $x_i \geq 0, 1 \leq i \leq 5$.
    b) $x_i \geq -3, 1 \leq i \leq 5$.