EX 1

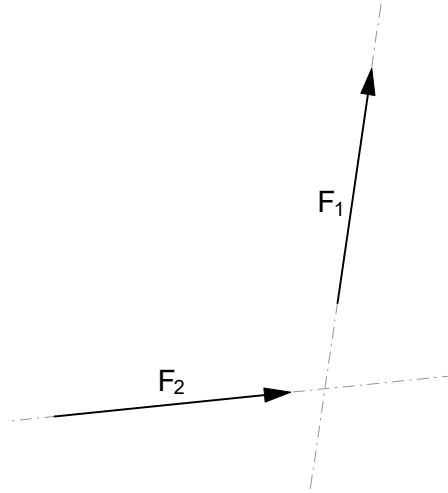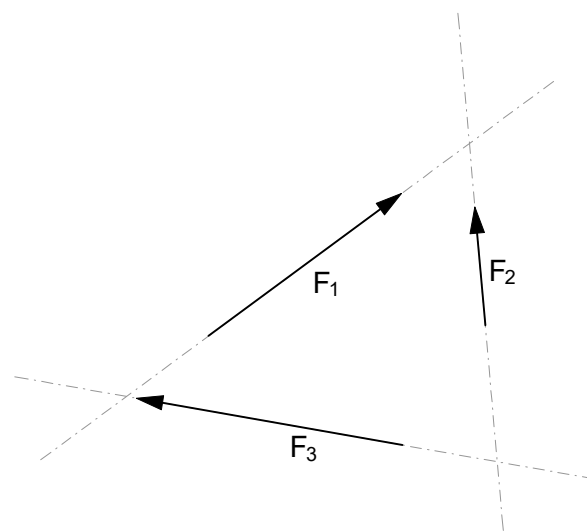Structural Design I – HS 17

Equilibrium

Name:

Koje:

S. 1 / 3

Task 1   Adding and Decomposing Forces

Find the position and magnitude of the resultant force R in a) and b) by means of graphic statics. Decompose the force R given in c) in horizontal and vertical force components F_H and F_V.
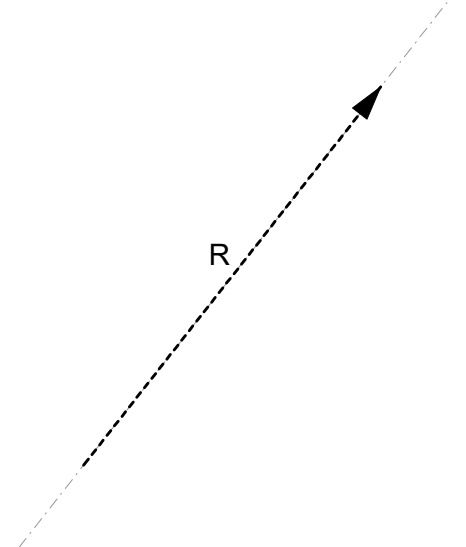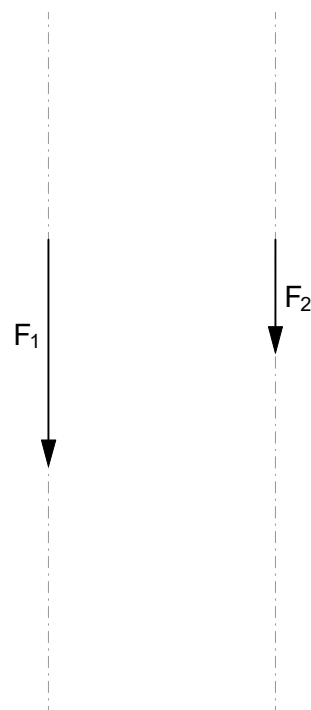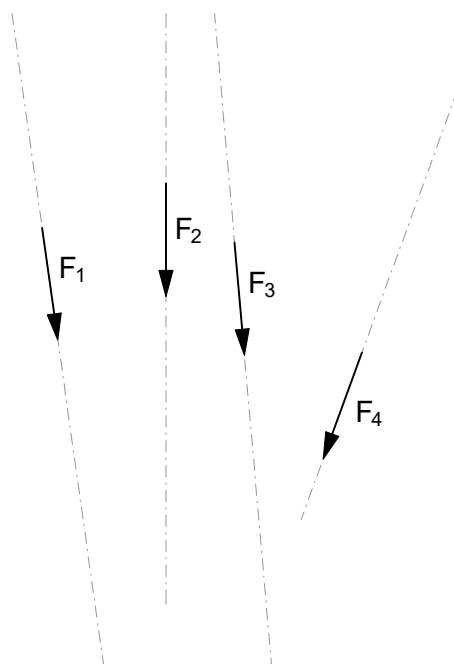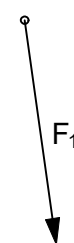
a)

b)

c)

Task 2   The Resultant of Parallel Forces

Find the position and magnitude of the resultant with the help of the proportion rule and draw it in the given case.

## Task 3   The Resultant of a set of Forces Acting in Any Direction

Find the resultant with the help of the trial funicular polygon.

F_1 = 45 kN
F_2 = 30 kN
F_3 = 15 kN
F_4 = 30 kN

form diagram
1:50

force diagram
1cm ≙ 15kN

EX 1

Structural Design I – HS 17

Equilibrium

Name:

Koje:

S. 2 / 3

Task 4 Drawing the Subsystems

Draw a corresponding force diagram for each subsystem (a-f). Determine the magnitude [kN] for each force and draw its direction in subsystem. Indicate tension forces with red and compression forces with blue colour. Explain the solution in situation e).
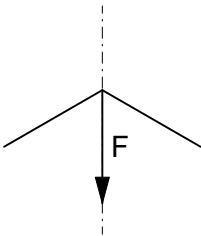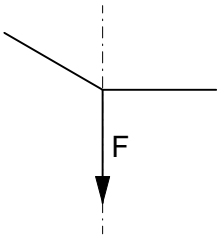
a)

1 2

F

subsystem

F
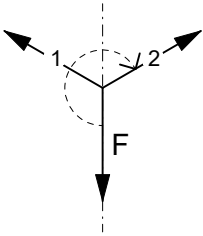
force diagram
1cm ≙ 10kN

b)

F

subsystem

F

force diagram
1cm ≙ 10kN

c)

F

subsystem

F

force diagram
1cm ≙ 10kN

d)

F

subsystem

F

force diagram
1cm ≙ 10kN

e)

F

subsystem

F
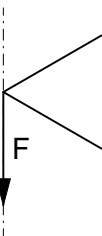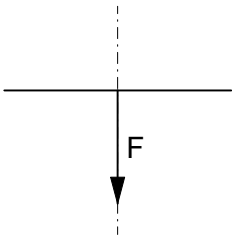
force diagram
1cm ≙ 10kN

f)

F

subsystem

F
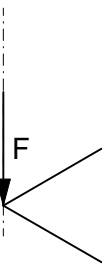
force diagram
1cm ≙ 10kN

Explanation for e):

_____

_____