

Ex 13.3.1: a) The values are as follows:

$$s = 2, t = 4, y = 4, x = 9, w = 5.$$

b) The value is  $\text{val}(F) = 18$ .

c) We have the following cuts with capacity 30: 1)  $(d, z), (g, z), (y, z)$  with  $\{z\}$  alone

2)  $(d, z), (g, z), (h, i)$  with  $\{z, i\}$  alone

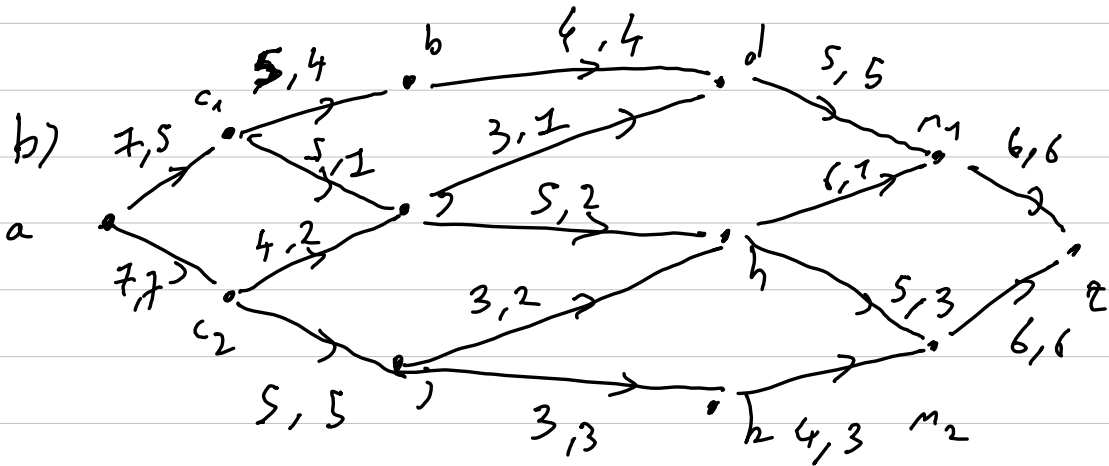
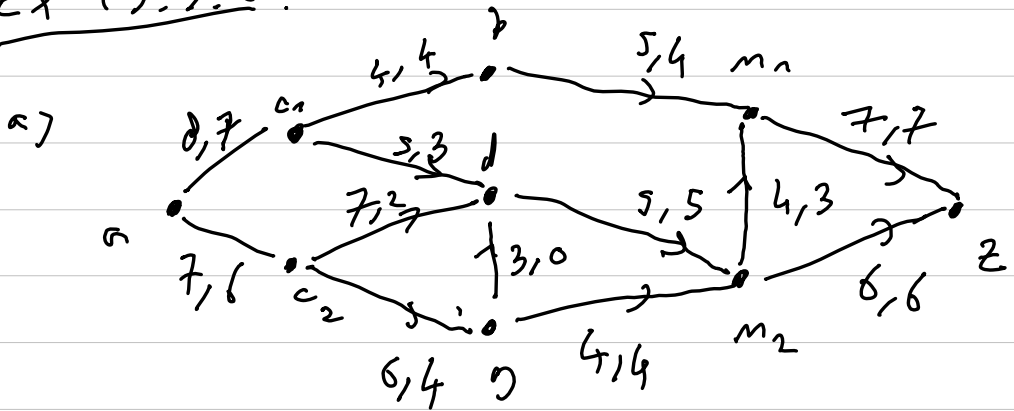
3)  $(b, d), (g, z), (i, z)$  with  $\{z, d\}$  alone.

Ex 13.3.4: a) The maximal flow is 45 and the minimal cut-set is  $\{m_2, m_2, z\} \cup \{a, c_1, c_2, c_3, d, g, h, i\}$

b) The maximal flow is 15 and the minimal cut-set is  $\{z\}$  alone.

c) Maximal flow is 4 and the minimal cut-set is  $\{a\}$  alone.

Ex 13.3.6:



Ex 13.3.7 :

