

SHEET 1

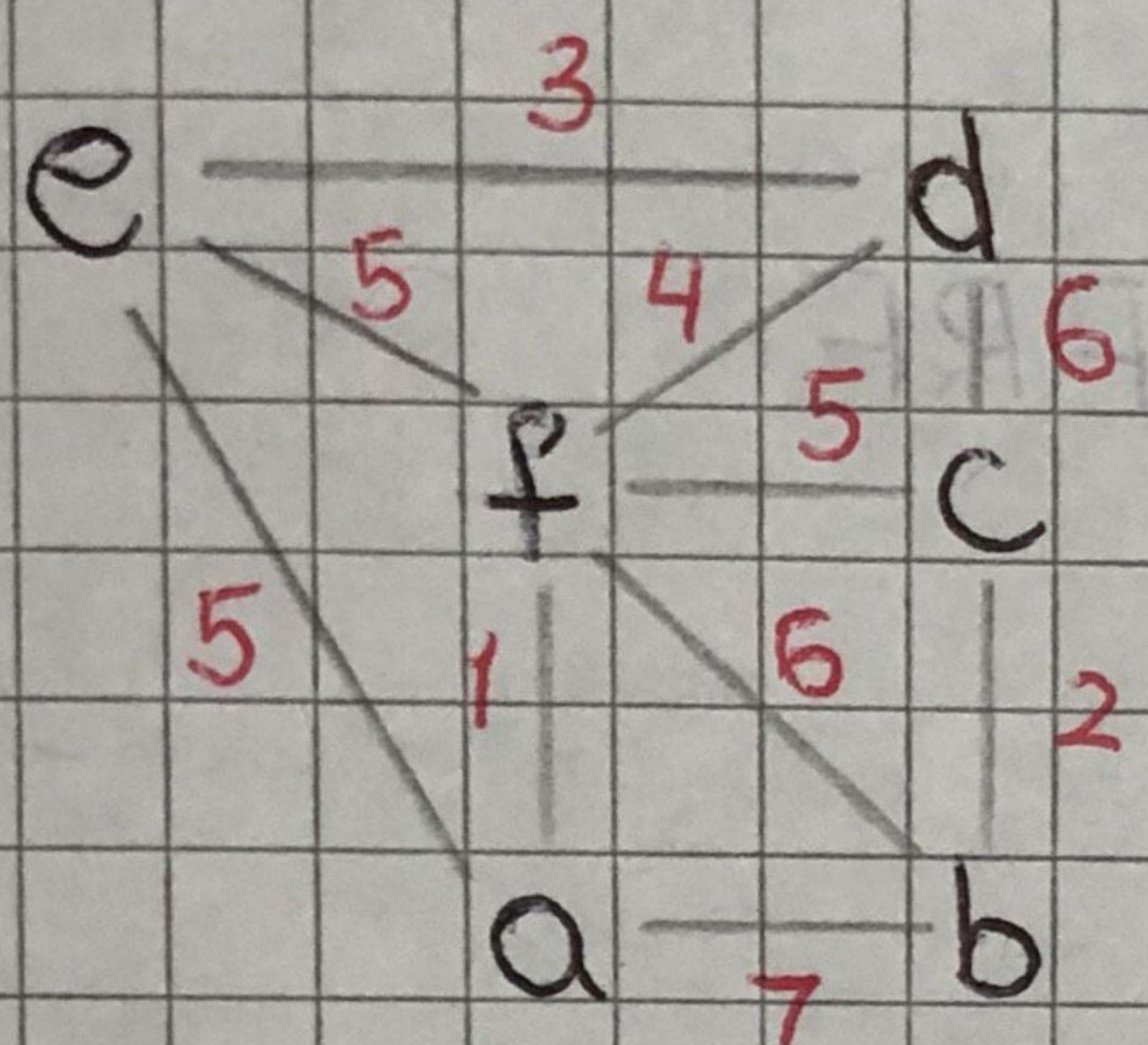
1.1) $G = (V, E)$

$$V = \{a, b, c, d, e, f\}$$

$$E = \{(a,b); (a,e); (a,f); (b,c); (b,f); (c,d); (c,f); (d,e); (d,f); (e,f)\}$$

$$E: (a,b) (a,e) (a,f) (b,c) (b,f) (c,d) (c,f) (d,e) (d,f) (e,f)$$

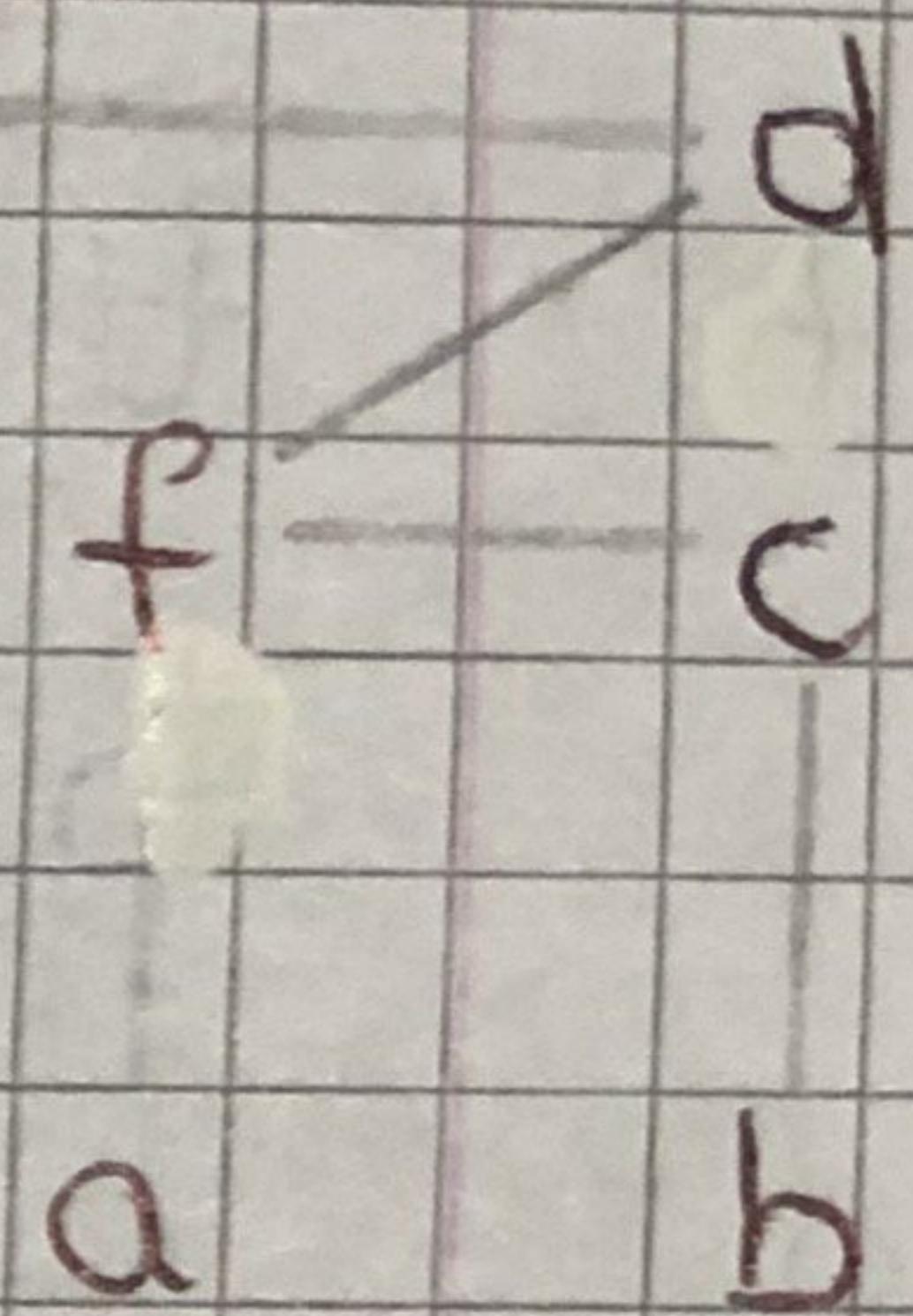
$$C: 7 \quad 5 \quad 1 \quad 2 \quad 6 \quad 6 \quad 5 \quad 3 \quad 4 \quad 5$$



Spanning

tree

\Rightarrow



start, $C = 0$

$$E' = \{\}$$

$$A = \{\{a\}, \{b\}, \{c\}, \{d\}, \{e\}, \{f\}\}$$

$$E' = \{(a, f)\}$$

step 1, $C = 1$

$$A = \{\{a, f\}, \{b\}, \{c\}, \{d\}, \{e\}\}$$

$$E' = \{(a, f); (b, c)\}$$

step 2, $C = 3$

$$A = \{\{a, f\}, \{b, c\}, \{d\}, \{e\}\}$$

$$E' = \{(a,f); (b,c); (d,e)\}$$

step 3, C = 5

$$A = \{\{a,f\}, \{b,c\}, \{d,e\}\}$$

$$E' = \{(a,f); (b,c); (d,e); (d,f)\}$$

step 4, C = 10

$$A = \{\{a,f,d,e\}, \{b,c\}\}$$

$$E' = \{(a,f); (b,c); (d,e); (d,f); (c,f)\}$$

step 5, C = 15

$$A = \{\{a,f,d,e,b,c\}\}$$

1.2) $\Sigma = \{L, R, F, P\}$

$$t = FFLFLFLFRFRRFFLFRF$$

$$P = FFLFR$$

a) naive string search

FFLFLFRFRFFFLFRF

FFLFR

FFLFr

FPLrP

FFLFr

FPLFr

FFLFr

FPLFr

FFLFr

FPLFr

FFLFR

10 alignments

22 comparisons

b) Boyer - Moore Bad character rule

FFLFLFRFRFFFLFRF

skips

PPLFR

1

FFLFR

0

PPLFR

0

PPLFR

2

PPLFR

1

FFLFR

6 alignments

16 comparisons

c) Lookup table

	0	1	2	3	4
F	F	F	L	F	R
L	0	1	-	0	1
R	0	1	2	3	-
F	-	-	0	-	0
P	0	1	2	3	4

1.3a) If such operators appear multiple times in an expression, it will show an error and we will not get an output. This happens because the computer doesn't know which order to take so as to carry out the operation. So we can say that there is a no defined behaviour.

For example: $3 == 3 == 3$

it will show ERROR

1.3b)

$$2^{\wedge}(5 * (2 + 3))$$