

## CIRCUIT COST

- multiple ways to define circuit cost

ex:

- 1) inverted are no-cost
- 2) logic gates cost 1.
- 3) logic gate inputs cost 1.

→ using this def<sup>n</sup> of cost helps make circuits more efficient

ex: cost of  $f = a + \underbrace{cd}_{1+2=3} + \underbrace{ab}_{1+2=3} + \underbrace{!(!(cd)+a)}_{1+2=3}$

$1+4=5$

total cost is 19:

- 3x 2-input AND = 9
- 1x 2-input OR = 3
- 1x 4-input OR = 5
- 2x non-trivial NOT (not bound to input vars.)

• cost of  $f = \underbrace{cd}_{1+2=3} + a$

$1+2=3$

total cost is 6:

- 1x 2-input AND = 3
- 1x 2-input OR = 3

## LITERALS

- if  $x$  is a binary variable, we write either  $x$  or  $!x$ .
- $x$  = uncomplemented/positive literal
- $!x$  = complemented/negative literal