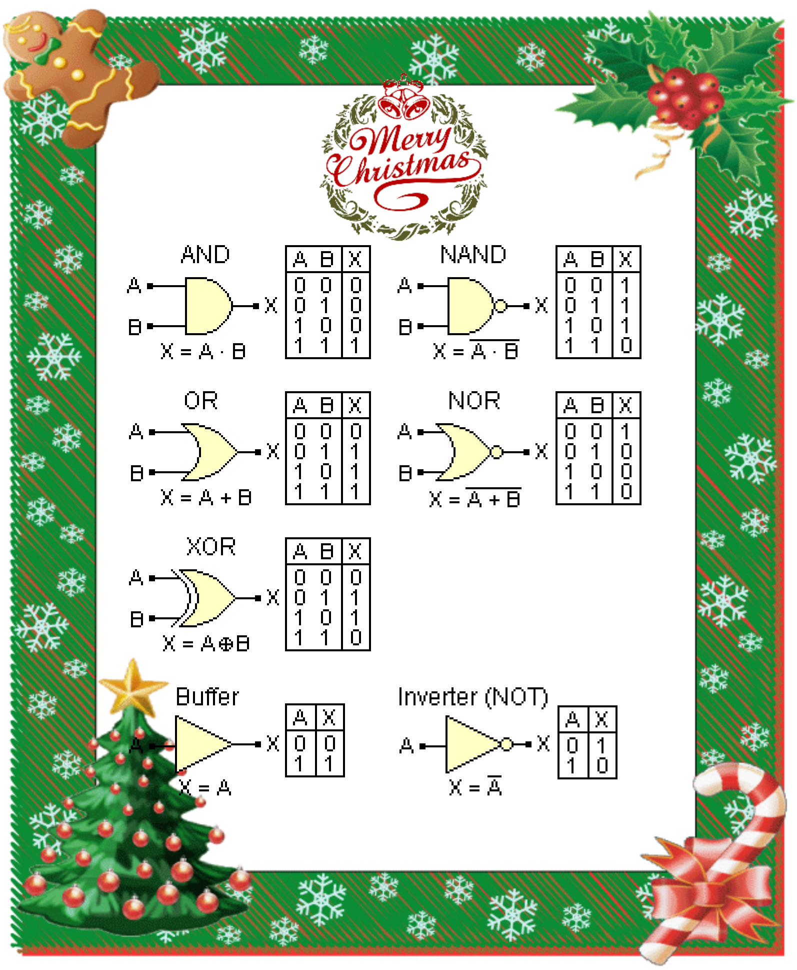
Grade 9

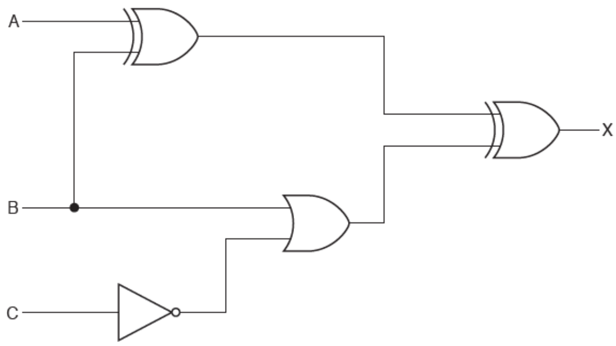
Worksheets no3

"Logic Circuit Design"



2018-2019

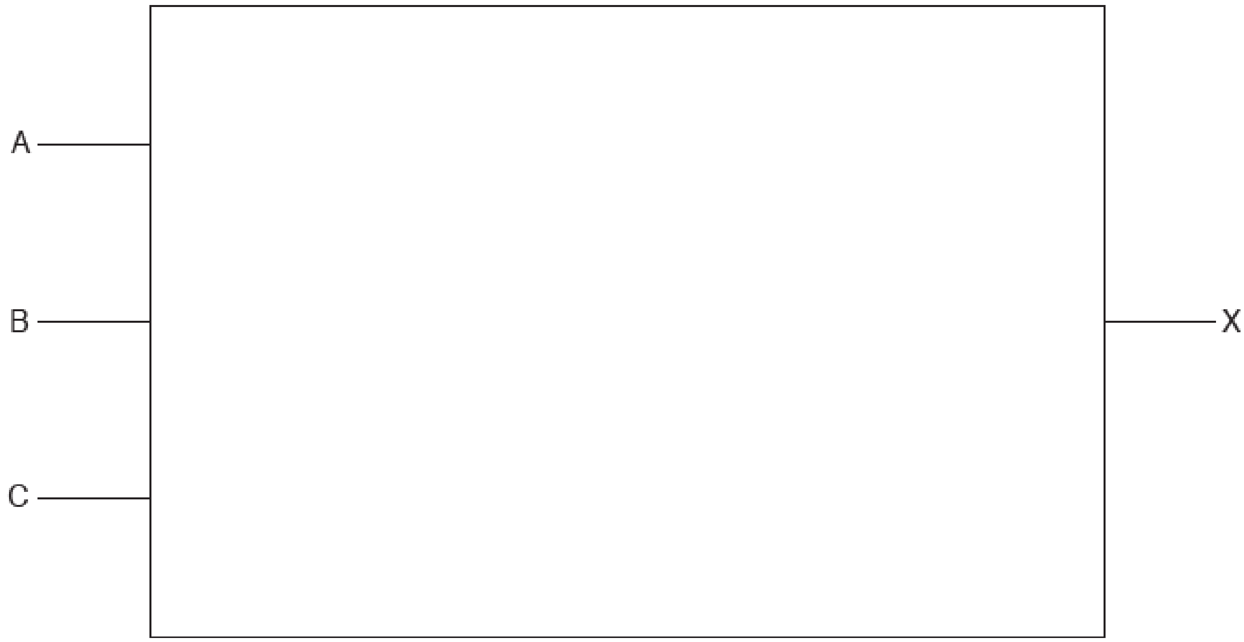
1. Complete the truth table for the following logic circuit:



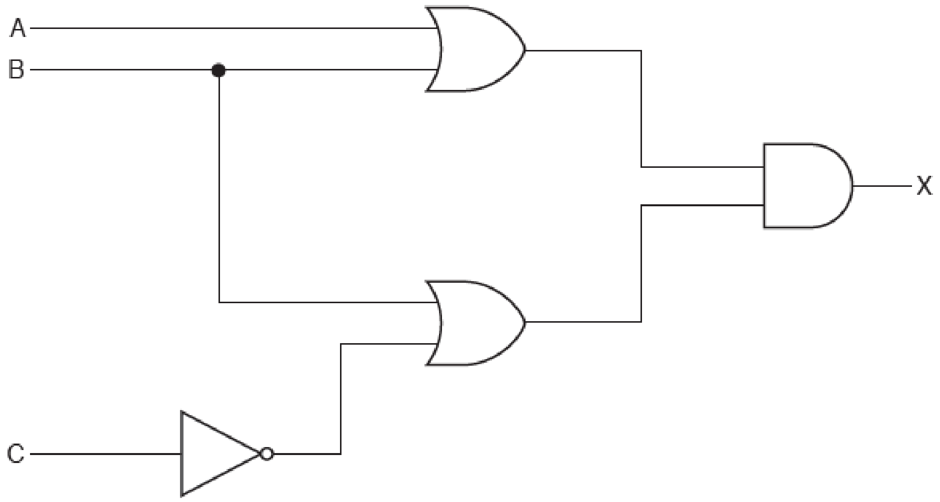
A	B	C	Workspace	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

2. Draw a logic circuit which corresponds to the following logic statement:

X = 1 if ((A is **NOT** 1 **OR** B is 1) **AND** C is 1) **OR** (B is **NOT** 1 **AND** C is 1)



3. Write a logic statement which corresponds to the following logic circuit:



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4. Complete the truth table below to prove that $A + \bar{B}$ is equivalent to $\overline{\bar{A} \cdot B}$

A	B					
0	0					
0	1					
1	0					
1	1					

5. Complete the truth table for the logic expression: **X** = NOT **A** AND (**B** NAND **C**)

A	B	C			

6. A greenhouse control system has four input parameters (H, D, T, W) and two outputs (X, Y).

Parameter	Description of parameter	Binary value	Condition
H	Humidity	0	Too low
		1	Acceptable
D	Day	0	Night
		1	Day
T	Temperature	0	Too high
		1	Acceptable
W	Windows	0	Closed
		1	Open

The watering system turns on (X = 1) if:

- **either** it is daytime **and** the temperature is too high
- **or** the humidity is too low.

The fan turns on (Y = 1) if the temperature is too high **and** the windows are closed.

a. Draw a logic circuit to represent the greenhouse control system.

b. Give a logic statement corresponding to the logic circuit above.

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c. Complete the truth table for this system.

R	T	W