

Section 1.8: Boolean Algebra

Exercises

Draw the gate representation for the following logical expressions.

1. $A + \bar{B}$

2. $\overline{A+B}$

3. $\bar{A}B$

4. $\bar{A}\bar{B}$

5. $\overline{A+B}$

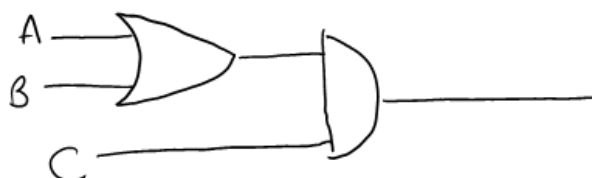
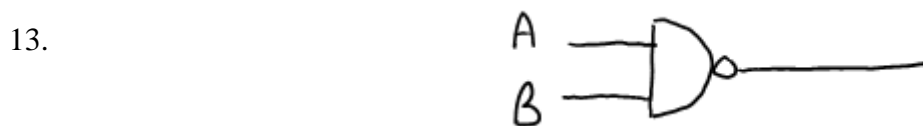
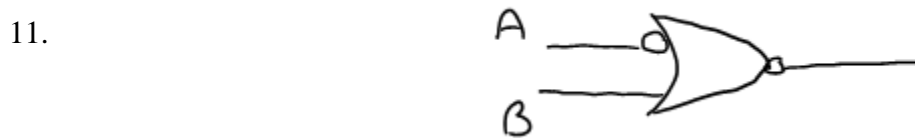
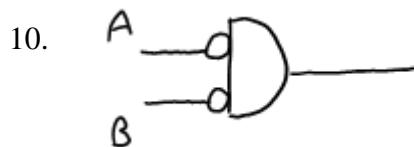
6. $A\bar{B}+C$

7. $A(B+\bar{C})$

8. \overline{ABC}

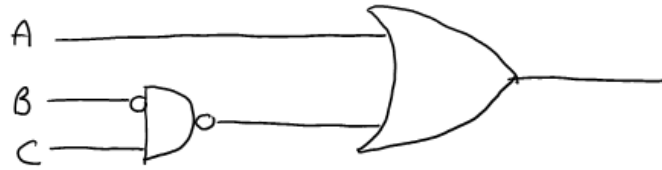
9. $\overline{\overline{\bar{A}\bar{B}}+C}$

Write the Boolean expression which corresponds to the following gates.

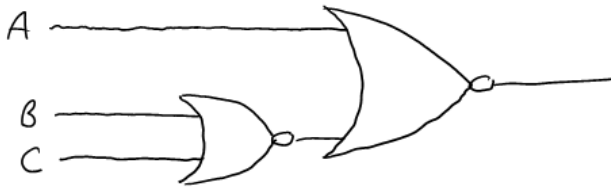


14.

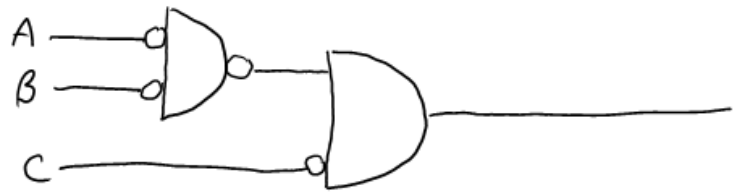
15.



16.



17.



Give the truth tables for the following expressions.

18. $A\bar{A}$

19. $A+1$

20. $A\bar{B}$

21. $\overline{A+B}$

22. $A+\bar{A}B$

23. $(A+B)C$

24. $A+B+\bar{C}$

Are the two expressions logically equivalent? Justify your answer by giving a truth table.

25. \overline{AB} and $\bar{A}\bar{B}$

26. $\overline{A+B}$ and $\overline{A}\overline{B}$

27. $A+BC$ and $(A+B)C$

28. $A+AB$ and A

29. $(A+B)+C$ and $A+(B+C)$

Simplify the following logical expressions using truth tables.

30. AA

31. $A+A$

32. $A+0$

33. $A+AB$

34. $A(\overline{A+B})$ – this one's a bit trickier! If you're stuck, try writing the truth tables for combinations of A and B, like $(A+B)$ for example, to find one that fits.