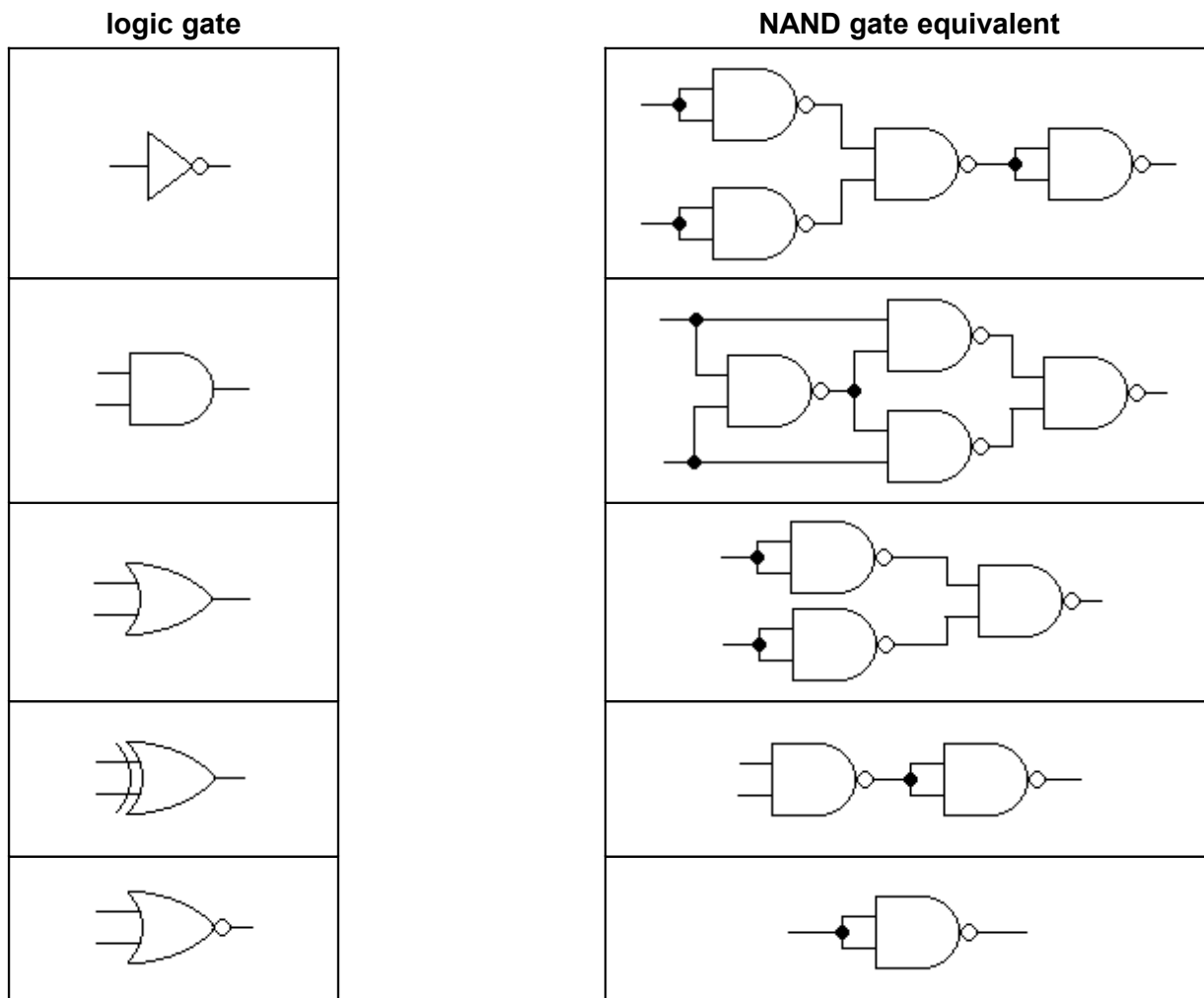


1 Link each **logic gate** with its **NAND gate equivalent**.



2 The NAND gate logic system below obeys these expressions.

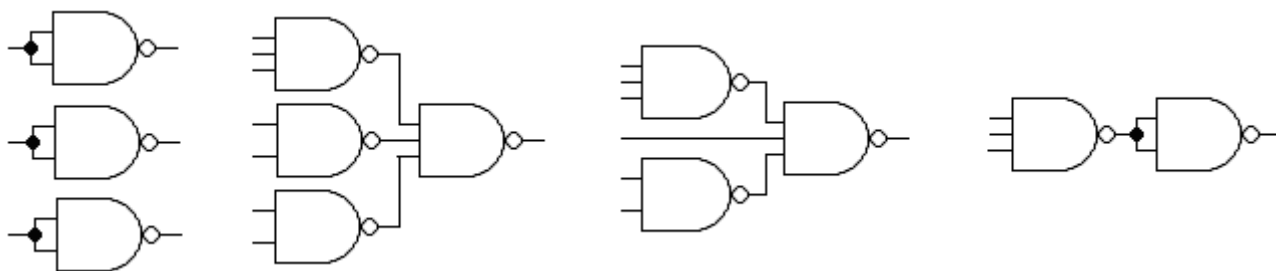
$$Z = C\bar{B}.A$$

$$Y = A + B.C + A\bar{B}\bar{C}$$

$$X = \bar{C}\bar{B}.A + C.B + \bar{B}.A$$

Complete the diagram by adding labels to inputs and outputs. Choose from these labels.

A B C X Y Z \bar{A} \bar{B} \bar{C}



3 Here are some reasons why logic systems are often made from NAND gates.
Which reasons are correct?

- NAND gates are the smallest integrated circuit.
- They make NAND gates cheaper to manufacture.
- The system takes up less room on a circuit board.

All of the gates are used in most of the integrated circuits.

It is harder to design a system using NOT, AND and OR gates.

Some Boolean expressions cannot be implemented with NOT, AND and OR gates.

4 Link each **logic system** with its **Boolean expression**.

logic system	Boolean expression
	$\bar{C} + B$
	$\bar{C}.A + B.A + \bar{C}.B$
	$C.\bar{B} + A$
	$B.\bar{C} + \bar{A}.B$
	$C.\bar{B}.A + C.B.\bar{A}$