EX:

Using logic gates of your choice, design a logic circuit with the following truth table:

A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

Draw a schematic diagram showing your logic circuit. That is, show the interconnected logic gates. You need not show power supplies for the gates.

sol'n: Although not required, simplifying the Boolean SOP (sum of products) expression for Y produces a more efficient solution.

$$Y = \bar{A}BC + A\bar{B}\bar{C} + AB\bar{C} + ABC$$

Terms that simplify:

$\bar{A}BC + ABC = BC$

$A\bar{B}\bar{C} + AB\bar{C} = A\bar{C}$

$AB\bar{C} + ABC \approx AB$ ← not needed

included in 1st two expressions so is redundant

$$Y = A\bar{C} + BC$$