Names (pair) _____ Date _____

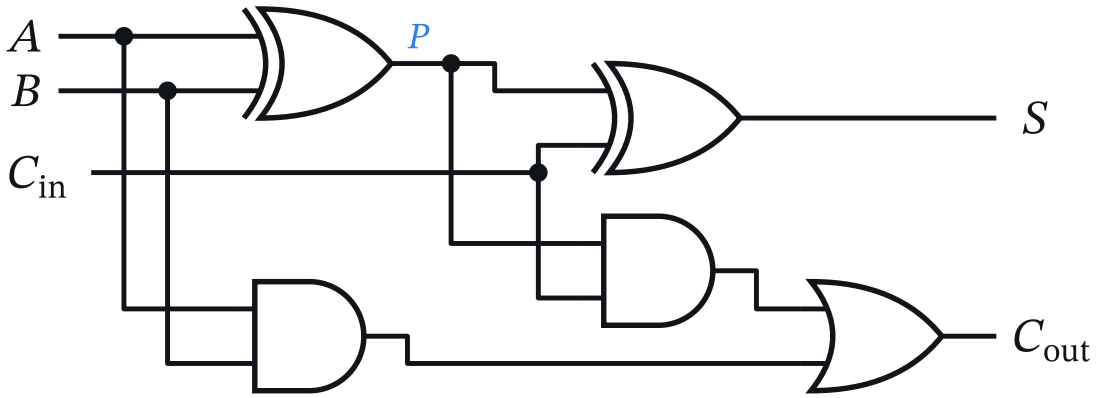
The Full Adder

Remember

A **full adder** adds three bits: A, B and the carry from the previous column C_{in}. It gives the sum S and the carry C_{out} into the next column. It is made of two half adders and an OR gate.

1 IN PAIRS Complete the table.

A	B	C_{in}	Total	C_{out}	S
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

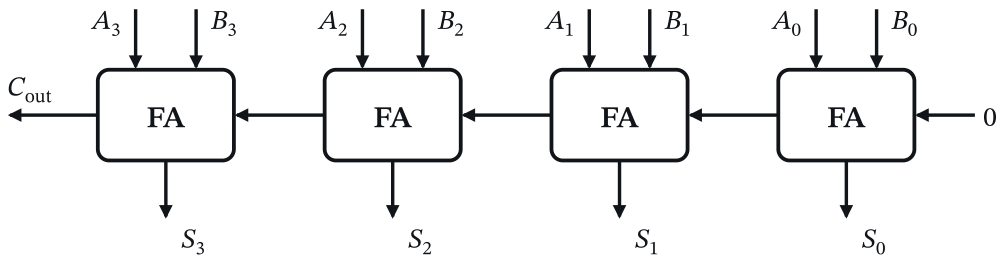


2 ON YOUR OWN Follow the signals for $A = 1, B = 1, C_{\text{in}} = 0$.

$P =$ ☐ $S =$ ☐ $C_{\text{out}} =$ ☐

Names (pair) _____ Date _____

3 IN PAIRS **Adding four bits.** Four full adders are joined in a row: each one's carry goes into the next. Add $0110 + 0111$ and write in the carries.



	☐	☐	☐	☐
	0	1	1	0
+	0	1	1	1
	☐	☐	☐	☐	☐

Check in decimal: ☐

$S_3\ S_2\ S_1\ S_0 =$ ☐

4 IN PAIRS How many full adders are needed to add two 8-bit numbers? Where does an overflow show up?

_____

_____

The Logic Gates app · otooly.com/logic-gates

Under **Load an example...** choose **Full adder** and check your table.

★ ON YOUR OWN **Exit card.** $A = 1, B = 0, C_{in} = 1 \rightarrow S =$ ☐ $C_{out} =$ ☐