

Karnaugh Maps



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What is a Karnaugh Map?

- A Karnaugh Map is a way of displaying a truth table into a different format
- They allow you to easily write out notation for a truth table

		CD			
		00	01	11	10
AB	00	X ⁰	X ¹	0 ³	X ²
	01	1 ⁴	1 ⁵	1 ⁷	0 ⁶
	11	0 ¹²	1 ¹³	0 ¹⁵	1 ¹⁴
	10	1 ⁸	0 ⁹	1 ¹¹	1 ¹⁰

Steps To Drawing A Karnaugh Map

1. Draw out the grid
2. Put your variables in their spots
3. Put all possible combos of those variables in
4. Fill out the table based on the truth table
5. Draw rings around similar outcomes in groups of 1, 2, 4, 8, 16...
6. Write out the notation based on these groups

X ⁰	X ¹	0 ³	X ²
1 ⁴	1 ⁵	1 ⁷	0 ⁶
0 ¹²	1 ¹³	0 ¹⁵	1 ¹⁴
1 ⁸	0 ⁹	1 ¹¹	1 ¹⁰

Example of Drawing Out A Karnaugh Map

A	B	C	Q1
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

	AB	00	01	11	10
C					
0		0	1	1	1
1		0	0	0	1

$$Q = BC' + AB'$$

Your Turn

Draw a Karnaugh Map for this table and then write its notation:

	AB	00	01	10	11
C					
0					
1					

A	B	C	Q1
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

Your Turn

Draw a Karnaugh Map for this table and then write its notation:

	AB	00	01	10	11
C					
0					
1					

A	B	C	Q1
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

Your Turn

Draw a Karnaugh Map for this table and then write its notation:

B	A	0	1
0			
1			

A	B	Q1
0	0	0
0	1	1
1	0	1
1	1	1