www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	1	1	0
$A.B$	0	x	0	0
$A.\overline{B}$	1	x	x	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(8,9,10,11)	$A.\overline{B}$
(5,7)	$\overline{A}.B.D$

y = AB' + A'BD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

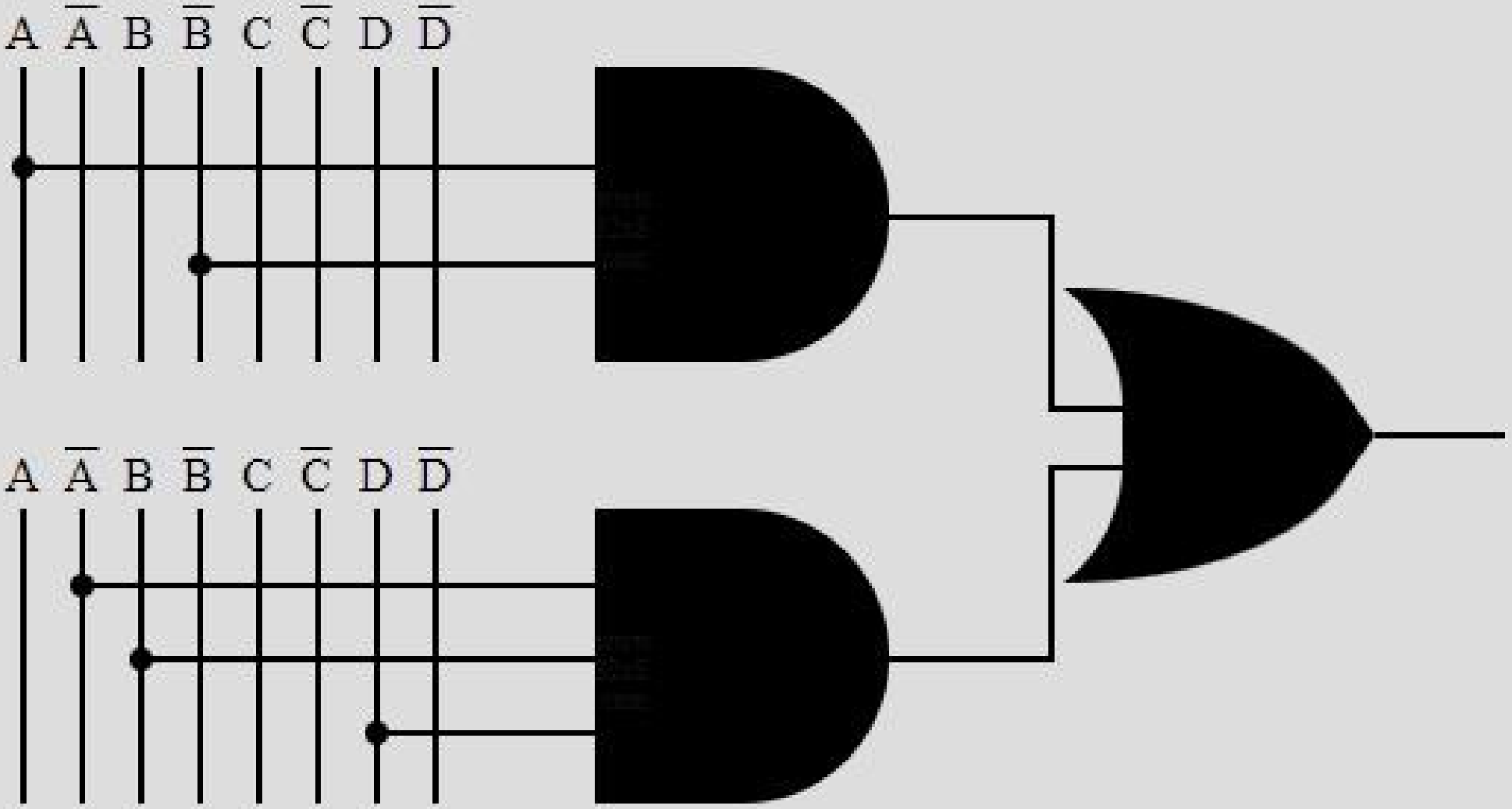
www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	1
9	1	0	0	1	x
10	1	0	1	0	x
11	1	0	1	1	x
12	1	1	0	0	0
13	1	1	0	1	x
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

$y = AB' + A'BD$


A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$
A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	1	1	0	1
$\overline{A}$.B	0	x	x	0
A.B	1	1	1	0
A.$\overline{B}$	1	1	1	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}$.B	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(0,1,8,9)	$\overline{B}.\overline{C}$
(0,2,8,10)	$\overline{B}.\overline{D}$
(8,9,12,13)	A.$\overline{C}$
(9,11,13,15)	A.D

y = B'C' + B'D' + AC' + AD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.

32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

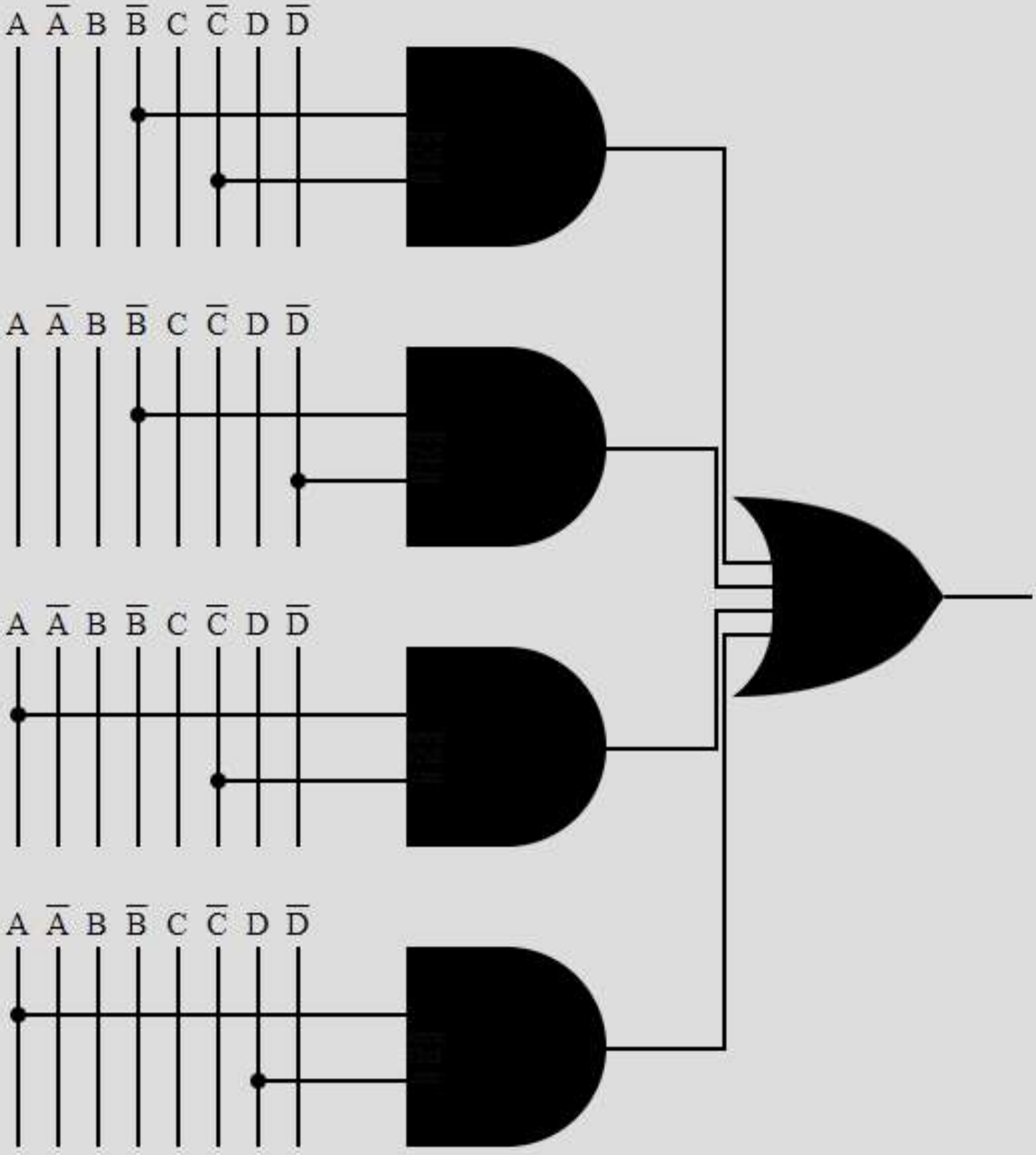
www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	1
1	0	0	0	1	1
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	x
6	0	1	1	0	0
7	0	1	1	1	x
8	1	0	0	0	1
9	1	0	0	1	1
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	0
15	1	1	1	1	1

© 2014-2022

$y = B'C' + B'D' + AC' + AD$



www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	1	0	0	0
$\overline{A}.B$	0	1	1	0
$A.B$	1	1	0	0
$A.\overline{B}$	1	1	1	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(8,9,10,11)	$A.\overline{B}$
(8,9,12,13)	$A.\overline{C}$
(0,8)	$\overline{B}.\overline{C}.\overline{D}$
(5,7)	$\overline{A}.B.D$

y = AB' + AC' + B'C'D' + A'BD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.

32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

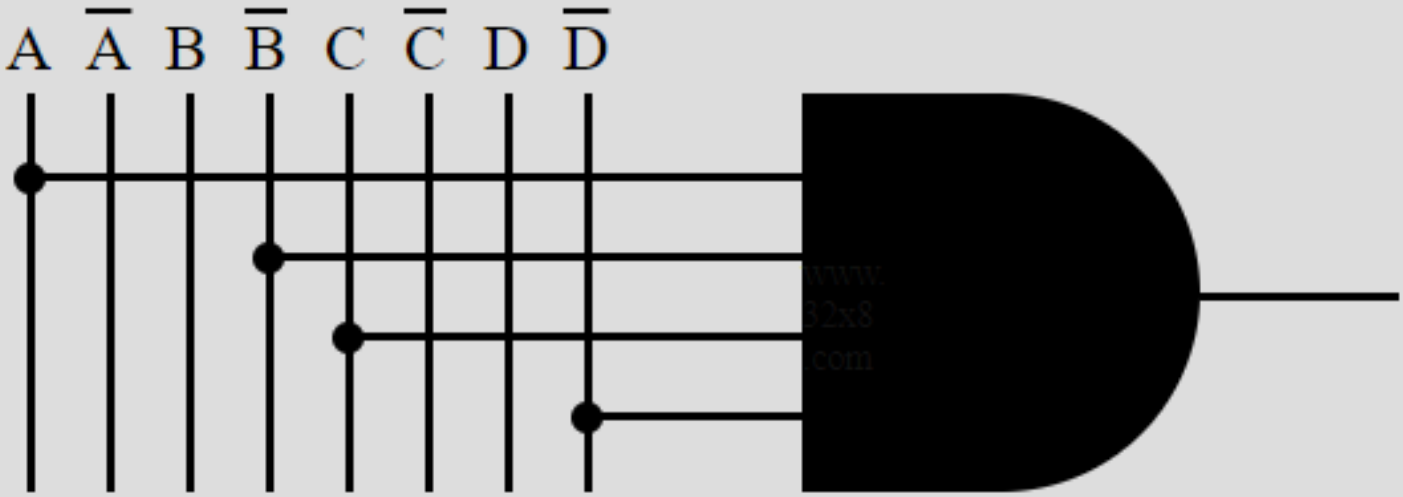
www.
32x8
.com

Truth Table

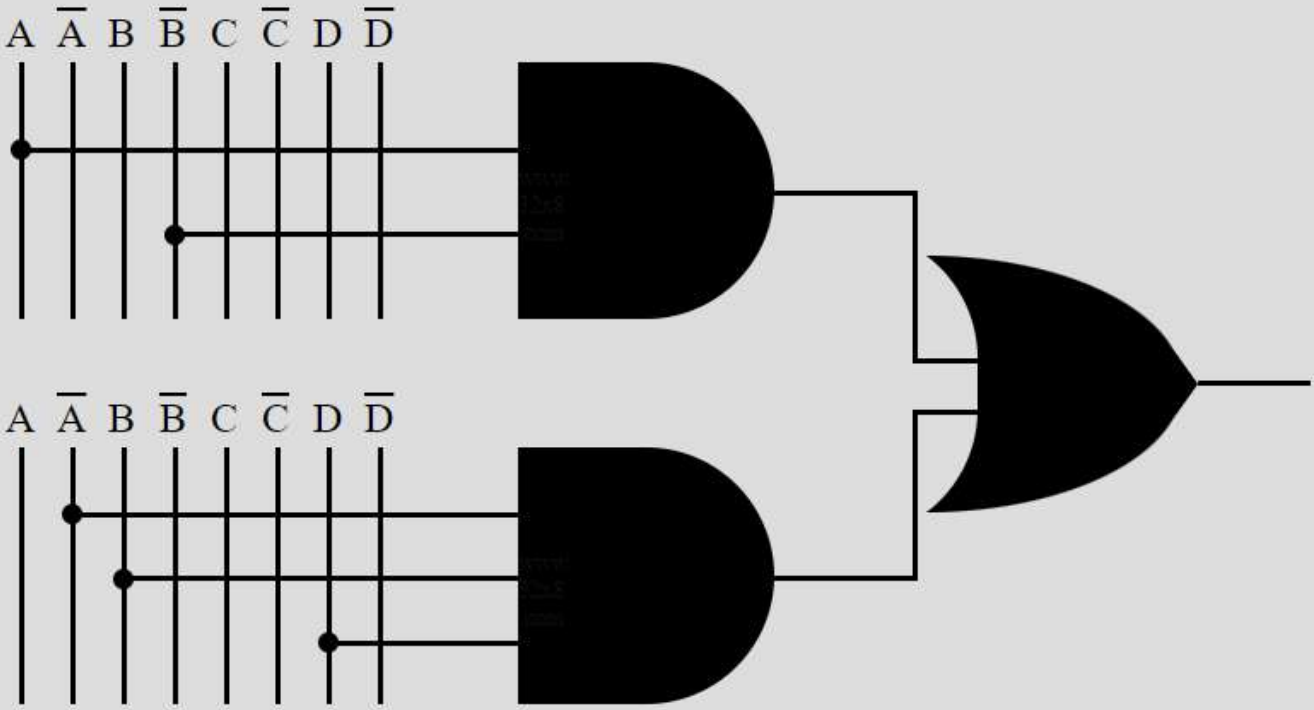
	A	B	C	D	Y
0	0	0	0	0	1
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	1
9	1	0	0	1	1
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

$y = AB'CD'$



y = AB' + A'BD


A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$
A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	1	1	0	1
$\overline{A}$.B	0	1	x	0
A.B	1	1	1	0
A.$\overline{B}$	1	1	1	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}$.B	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(0,2,8,10)	$\overline{B}.\overline{D}$
(1,5,9,13)	$\overline{C}.D$
(8,9,12,13)	A.$\overline{C}$
(9,11,13,15)	A.D

y = B'D' + C'D + AC' + AD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.

32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

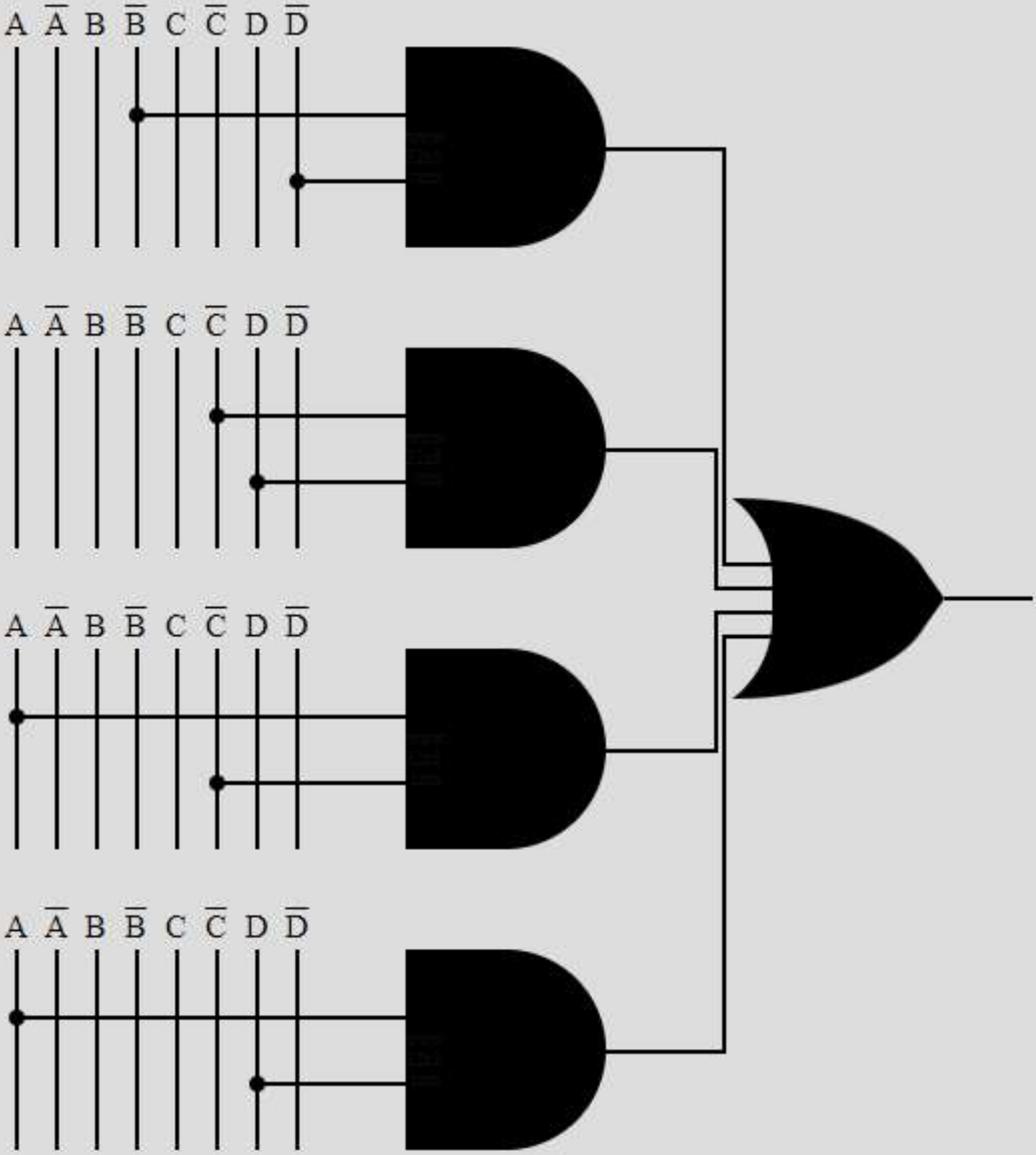
www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	1
1	0	0	0	1	1
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	x
8	1	0	0	0	1
9	1	0	0	1	1
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	0
15	1	1	1	1	1

© 2014-2022

$y = B'D' + C'D + AC' + AD$



www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	1	x	0
$A.B$	x	1	0	0
$A.\overline{B}$	0	0	0	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(5,13)	$B.\overline{C}.D$

y = BC'D

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x

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

© 2014-2022

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	0	0	0
$A.B$	x	x	0	0
$A.\overline{B}$	0	x	0	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(10)	$A.\overline{B}.C.\overline{D}$

y = AB'CD'

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x

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

© 2014-2022

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	1	0	0	0
$\overline{A}.B$	0	0	0	0
$A.B$	1	1	0	0
$A.\overline{B}$	0	1	1	0

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(9,11)	$A.\overline{B}.D$
(12,13)	$A.B.\overline{C}$
(0)	$\overline{A}.\overline{B}.\overline{C}.\overline{D}$

y = AB'D + ABC' + A'B'C'D'

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

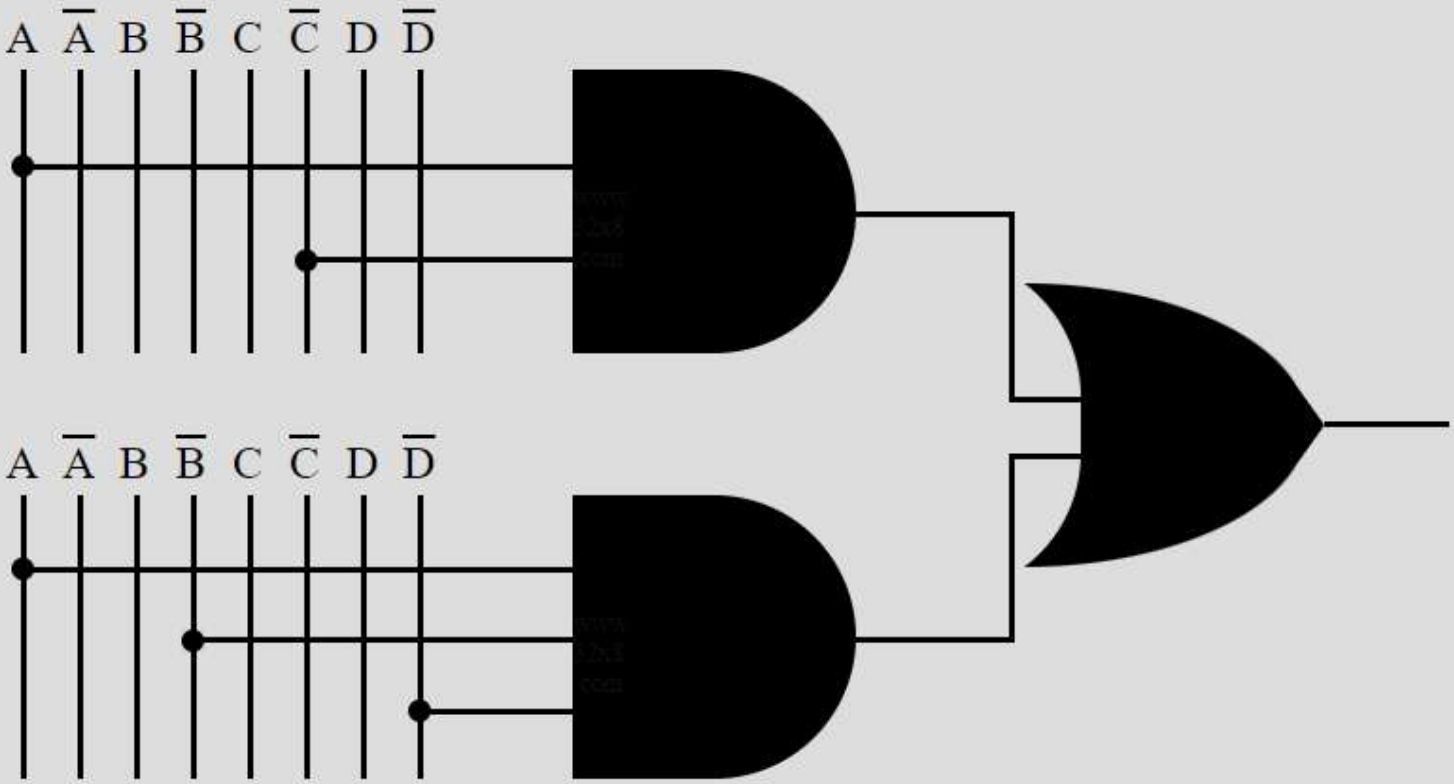
www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	1
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	0
8	1	0	0	0	0
9	1	0	0	1	1
10	1	0	1	0	0
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	1
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

$y = AC' + AB'D'$


A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$
A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	0	0	0
A.B	x	x	0	0
A.$\overline{B}$	x	1	0	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(8,9,12,13)	A.$\overline{C}$
(8,10)	A.$\overline{B}$.$\overline{D}$

y = AC' + AB'D'

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

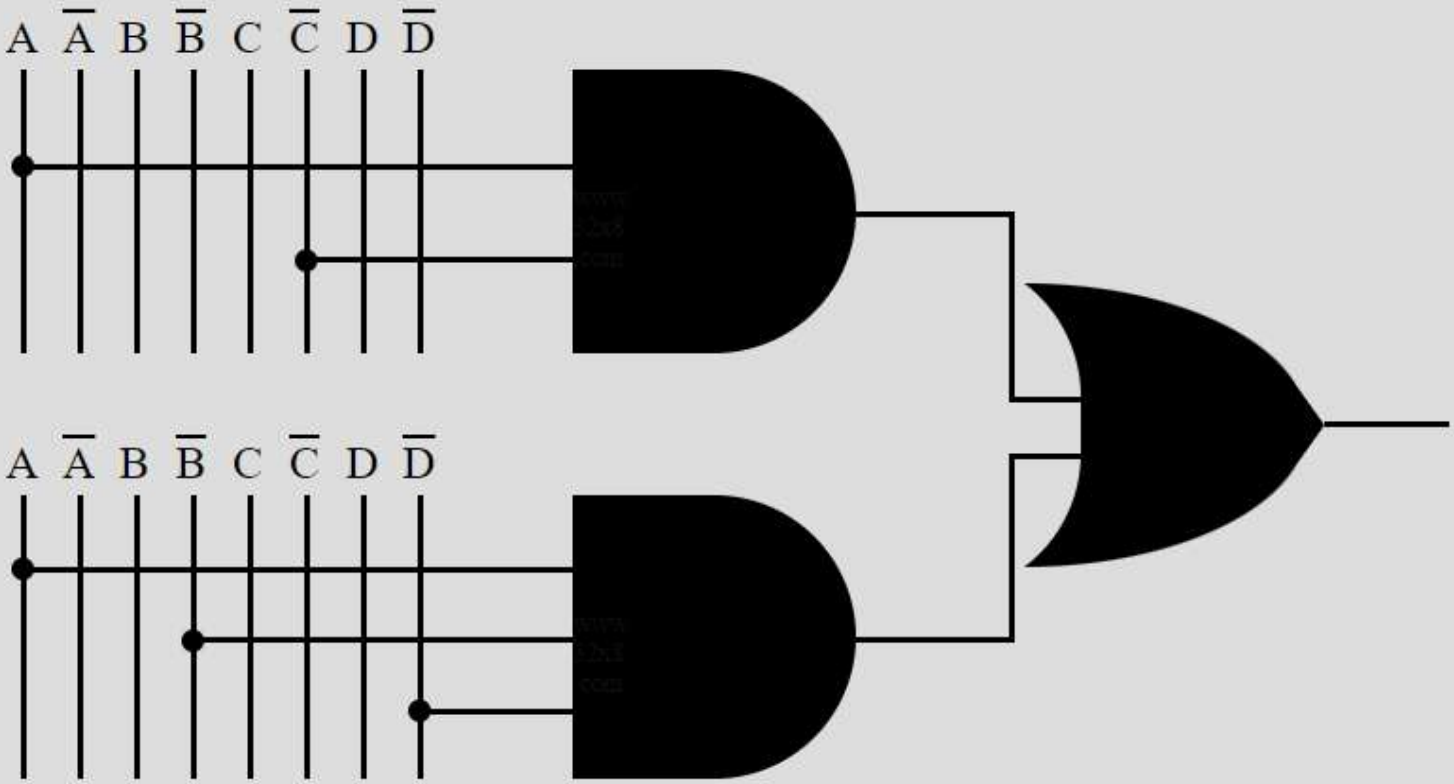
www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	0
8	1	0	0	0	x
9	1	0	0	1	1
10	1	0	1	0	1
11	1	0	1	1	0
12	1	1	0	0	x
13	1	1	0	1	x
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

$y = AC' + AB'D'$


A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$
A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	1	1	0
$A.B$	x	x	0	0
$A.\overline{B}$	x	1	1	1

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

(8,9,10,11)	$A.\overline{B}$
(5,7)	$\overline{A}.B.D$

y = AB' + A'BD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	x
9	1	0	0	1	1
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	x
13	1	1	0	1	x
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	x	0	x
$\overline{A}.B$	0	0	0	0
A.B	1	1	x	0
A.$\overline{B}$	x	x	x	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(8,9,12,13)	A.$\overline{C}$

y = AC'

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

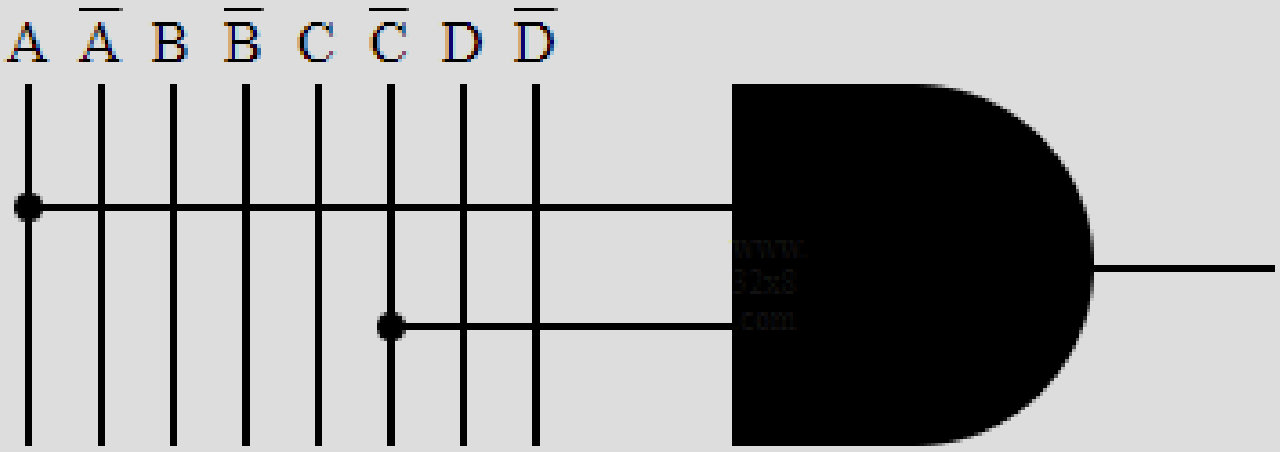
Truth Table

	A	B	C	D	Y
0	0	0	0	0	x

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

© 2014-2022

$y = AC'$



www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	x	0	x
$\overline{A}.B$	0	0	x	0
A.B	x	0	x	0
A.$\overline{B}$	x	x	x	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

y = 0

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	x
2	0	0	1	0	x
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	x

8	1	0	0	0	x
9	1	0	0	1	x
10	1	0	1	0	x
11	1	0	1	1	x
12	1	1	0	0	x
13	1	1	0	1	0
14	1	1	1	0	0
15	1	1	1	1	x

© 2014-2022

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	x	0	x
$\overline{A}$.B	0	0	0	0
A.B	1	x	x	0
A.$\overline{B}$	x	x	x	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}$.B	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(8,9,12,13)	A.$\overline{C}$

y = AC'

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

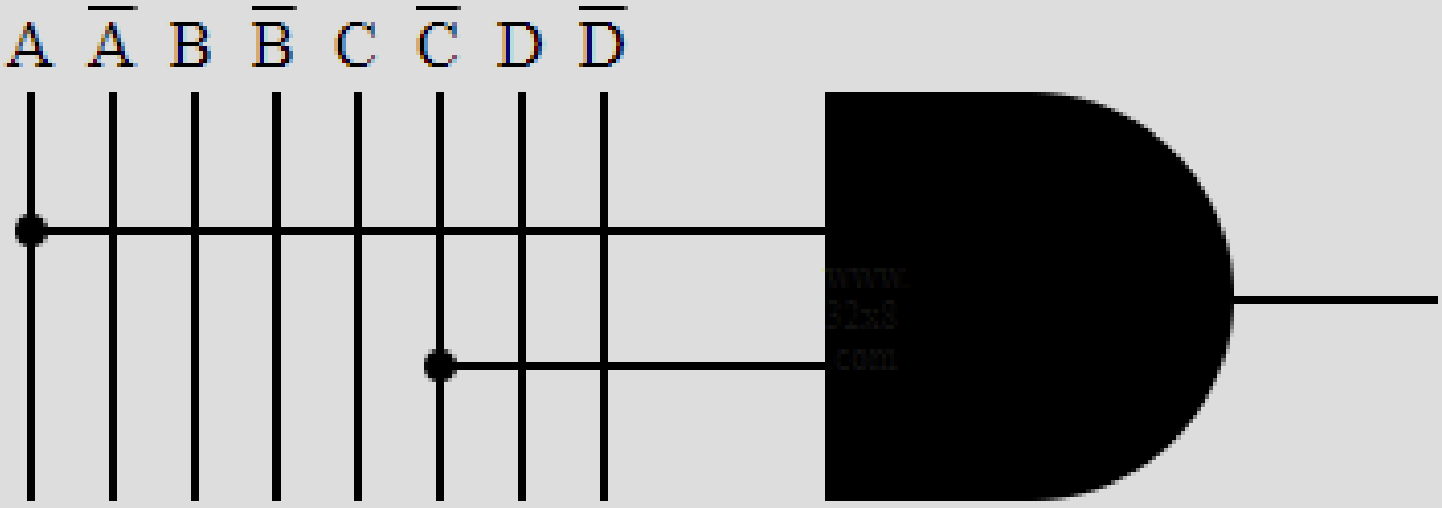
Truth Table

	A	B	C	D	Y
0	0	0	0	0	x

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

© 2014-2022

$y = AC'$



www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}$.B	0	1	1	0
A.B	x	x	0	0
A.$\overline{B}$	x	0	x	0

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}$.B	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

(5,7)	$\overline{A}$.B.D

y = A'BD

A $\overline{A}$ B $\overline{B}$ C $\overline{C}$ D $\overline{D}$

www.
32x8
.com

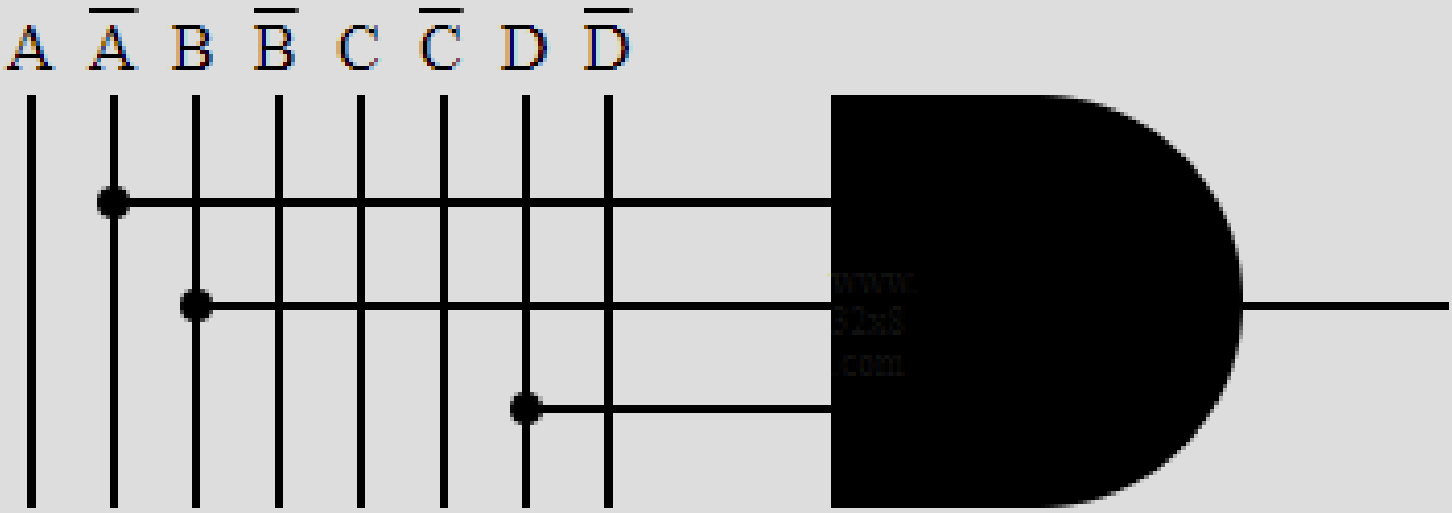
Truth Table

	A	B	C	D	Y
0	0	0	0	0	x

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

© 2014-2022

$y = A'BD$



www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	x	0	0	0
$\overline{A}.B$	0	0	0	0
$A.B$	0	x	0	0
$A.\overline{B}$	x	0	x	0

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	$C.D$	$C.\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
$A.B$	12	13	15	14
$A.\overline{B}$	8	9	11	10

Groups

$y = 0$

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	0

8	1	0	0	0	x
9	1	0	0	1	0
10	1	0	1	0	0
11	1	0	1	1	x
12	1	1	0	0	0
13	1	1	0	1	x
14	1	1	1	0	0
15	1	1	1	1	0

© 2014-2022

www.32x8.com

SUM of PRODUCTS

Map

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	x	x	x	x
$\overline{A}.B$	x	x	x	x
A.B	x	x	x	x
A.$\overline{B}$	x	x	x	x

Map Layout

	$\overline{C}.\overline{D}$	$\overline{C}.D$	C.D	C.$\overline{D}$
$\overline{A}.\overline{B}$	0	1	3	2
$\overline{A}.B$	4	5	7	6
A.B	12	13	15	14
A.$\overline{B}$	8	9	11	10

Groups

y = 0y = 1

Truth Table

	A	B	C	D	Y
0	0	0	0	0	x
1	0	0	0	1	x
2	0	0	1	0	x
3	0	0	1	1	x
4	0	1	0	0	x
5	0	1	0	1	x
6	0	1	1	0	x
7	0	1	1	1	x

8	1	0	0	0	x
9	1	0	0	1	x
10	1	0	1	0	x
11	1	0	1	1	x
12	1	1	0	0	x
13	1	1	0	1	x
14	1	1	1	0	x
15	1	1	1	1	x

© 2014-2022