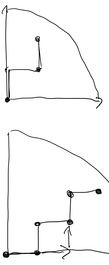

(3,2)

$3^2+2^2 \leq 4^2$

$8+4 \leq 16$ ✓

(0,4)

2 bits/num

8 bits total

$2^{16}+2$ queries $16 \cdot 2^{16}$ bits total

$a \text{ xor } b = P$

solve for b

$x \& y = p$

$x | y = q$

$a \text{ xor } a \text{ xor } b = a \text{ xor } p$

$0 \text{ xor } b$

$b = a \text{ xor } p$

Can solve in n-1 queries if know first

$a \& b$

$a | b$

$a \text{ xor } b$

a	b	$\&$	$\|$	xor
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0

How to break symmetry??

$a | b = 0 \Rightarrow a = 0 \wedge b = 0$

$a | b = p \quad p \neq 0$

highest bit of p

$a | b = p \quad b | c = q$

1	1	$b \vee (a \wedge c)$
0	1	$a = 0 \wedge b = 0 \wedge c = 1$
1	0	$a = 1 \wedge b = 0 \wedge c = 0$
0	0	$a = b = c = p$

a	b	c	$a \vee b$	$b \vee c$	$a \vee c$
0	0	0	0	0 ✓	
0	0	1	0	1 ✓	
0	1	0	1	1	0 ✓
0	1	1	1	1	1
1	0	0	1	0 ✓	
→ 1	0	1	1	1	1
→ 1	1	0	1	1	1
→ 1	1	1	1	1	1