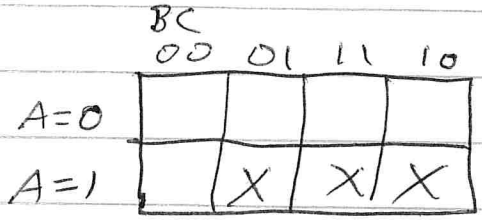
Set notes

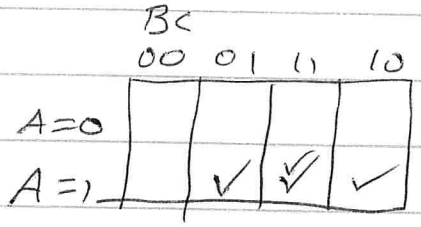
true? $A \cap (B \cup C) \subseteq (A \cap B) \cup (A \cap C)$

$(a(b+c)) \rightarrow (ab + ac)$

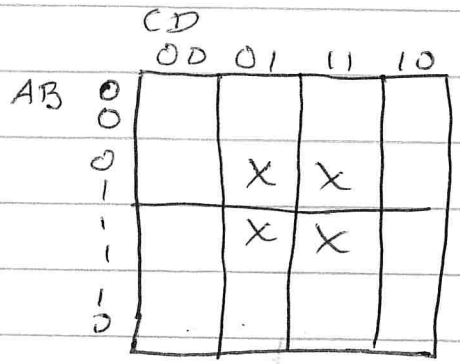
is this ever false?



$A \cap (B \cup C)$



$(A \cap B) \cup (A \cap C)$



x's name what set?

$B \cap D$

$\cup$ and $\cap$ using bitwise ops

```
  10101101     {0,2,3,5,7}
AND 11110000   {4,5,6,7}
    10100000   {5,7}
```

```
  01101011
AND 00011111
    00001011
```

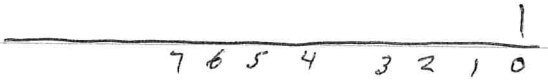
```
  10101101
OR 11110000
   11111101
```

```
  01101011
OR 11110000
   11111011
```

```
  10101101
XOR 11110000
    01011101
```

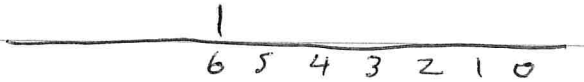
```
  01101011
XOR 11110000
    10011011
```

Binary rep'n of 1 : {0}

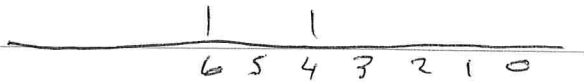


x = 1 << 4 {4}

y = 1 << 6 {6}



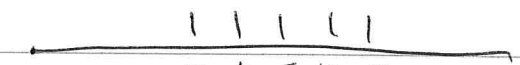
z = x + y add {4, 6}



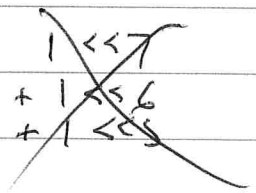
numerically

$= 2^6 + 2^4$

Suppose {3, 4, 5, 6, 7}



$2^7 + 2^6 + 2^5 + 2^4 + 2^3$



8 short of 256

2^3 short of 2^8

$2^8 - 2^3$

$$2^a + 2^{a-1} + 2^{a-2} + \ldots + 1 = \boxed{2^{a+1} - 1}$$

$$2^a + 2^{a-1} + \ldots + 2^b = \boxed{2^{a+1} - 2^b}$$

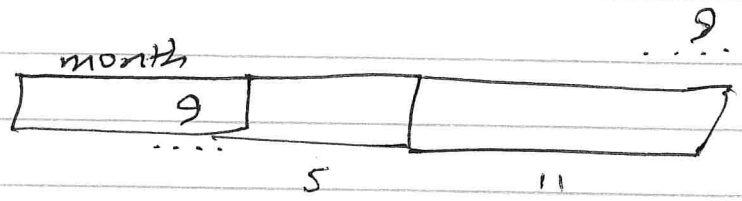
1 << (a+1)

− 1 << b

	size	value
month	4	9
day	5	23
year	11	2020

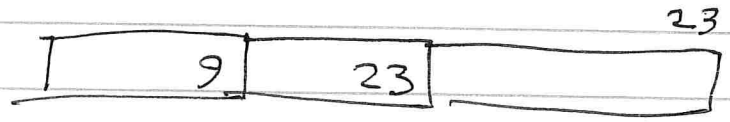
month = 9

date = month << 16



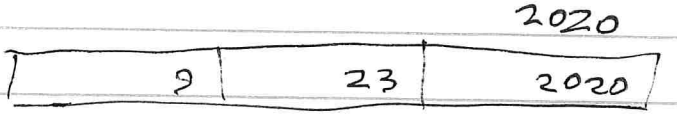
day = 23

date |= day << 11



year = 2020

date |= year



license plate: L L L # # #

$\underbrace{26 \cdot 26 \cdot 26}_{17,576} \cdot \underbrace{10 \cdot 10 \cdot 10}_{1,000} \Rightarrow 17,576,000$

phone #: _ _ _ - _ _ _ _ $< 10^7$

not 7^{10}