Extra Credit 2.

x is off, O is on.

$\{1,2,\ldots M\}$ $\left\lceil \frac{M}{N} \right\rceil$

~~$1_x 2_x 3_x$~~

$1_x\ 2_x\ 3_x\ 4_x \cdots n_x$

After person 1. $1_o\ 2_o\ 3_o\ 4_o \cdots n_o$

Person 2. $1_o\ 2_x\ 3_o\ 4_x \cdots n_x$ ← if n is even

n_o ← if n is odd

Person 3. $1_o\ 2_x\ 3_x\ 4_o\ 5_o\ 6_o \cdots$

1 2 3

Person 4. $1_o\ 2_x\ 3_x\ 4_x | 5_o\ 6_o \cdots$

$\frac{3}{2}$ 1

Person 5. $1_o\ 2_x\ 3_x\ 4_x\ 5_x | 6_o \cdots$

Person 6. $1_o\ 2_x\ 3_x\ 4_x\ 5_x\ 6_x$

After Person 1. $(1,2,3 \ldots n)$ onn

~~After~~ Person 2, remove all 2n, half on

~~after~~ 3, $\frac{n}{3}$

1, 2, 3, 4, 5, 6, 7, 8, 9

size $S = n$

after person 2, $S - \left\lfloor \frac{n}{2} \right\rfloor = S_1$ $\left\lfloor \frac{n}{3} \right\rfloor$ = no change

after Person 3, ~~$S_1 - \left\lfloor \frac{n}{3} \right\rfloor$~~ $S_1 - \left\lceil \frac{\text{no changed}}{2} \right\rceil + \left\lfloor \frac{\text{no cha}}{2} \right\rfloor$

persons entering.
↓

let s be the set containing all TVs that are on.

0. $S = \{\}$.

1. $S_1 = \{1, 2, 3, \ldots, n\}$, $|S| = n$

2. $|S_2| = n - \left\lfloor \frac{n}{2} \right\rfloor^{th} \rightarrow$ b/c $|s|$ might be odd

{all odd in S_2}

3. * half of the no divisible by 3 will be divisible by 2. so while half of the TVs divisible by 3 are turned off, half are turned on. ~~So, the max no of TVs turned~~ So, the change in the no of tvs turned on is one or zero

if $\left\lfloor \frac{n}{2} \right\rfloor$ is even, no change

if $\left\lfloor \frac{n}{3} \right\rfloor$ is odd, $|S_3| = |S_2| + 1$

we know the first number is divisible by 3.

$$|S_3| = |S_2| + \left\lfloor \frac{n}{3} \right\rfloor \text{ MOD } 2$$

types of TVs here: ~~All odd~~

1, 2, 8 odds that are not divisible by 3 and evens that are divisible by 3

4 no of TVs divisible by 4 is $\left\lfloor \frac{n}{4} \right\rfloor$

some of the numbers, like 8, are off, but some, like 12, are on

no of TVs divisible by 4, that are on, are $\left\lfloor \frac{n}{4\times3} \right\rfloor$ (these are turned off)

10 3

$\frac{n}{4}$

$\left\lfloor \frac{40}{4} \right\rfloor = \left\lfloor \frac{10}{3} \right\rfloor$

no of TVs divisible by 4, that are off, are $\left\lfloor \frac{n}{4} \right\rfloor - \left\lfloor \frac{n}{4\times3} \right\rfloor$ (these are turned on)

$$|S_4| = |S_3| -$$

$S = \{\}$

1. $S_1 = \{1, 2, \dots n\}$ $|S_1| = n$
2. $|S_2| = n - \left\lfloor \frac{n}{2} \right\rfloor$, S_2 has all odds
3. $|S_3| = |S_2| - \left\lfloor \frac{S_2}{3} \right\rfloor \bmod 2$

   S_3 hase 1, all odds after 5 that are not ~~divisible by~~ multip of 3, all even multiples of 3
4. $|S_4| = |S_3| +$