

2.

In order to archive this Maria needs a number that multiplied by a number divisible from 3 then if it now it could become itself again. Such number is 25:

$$25 \cdot 3 = 75$$

$$75 \cdot 3 = 225$$

~~25~~ 25

if we erase any digit from 225

that is a ~~2~~ 2

then we get 25 again

The entire process looks like this

25 → 75 → 225 → 25

We can do the same with 75 without the rule above taking place. If a number takes part in a successful process then it could be a starting number as long as it has only two digits,

75 → 225 → 25 → 75

3. Let's assume how many days will it last until it is full.

If it fills on day 1

20 cm	
100 cm ²	100 cm ²
100 cm ²	100 cm ²

$$100 \text{ cm}^2 \cdot 4 = 400 \text{ cm}^2$$

$$400 \text{ cm}^2 \text{ is } 100\% \cdot 400 \text{ cm}^2 \times$$

If it fills on day 2

40		
100 cm ²	200 cm ²	100 cm ²
200 cm ²	400 cm ²	100 cm ²
100 cm ²	200 cm ²	100 cm ²

$$200 \cdot 4 + 100 \cdot 4 = 1200 \text{ cm}^2$$

$$1200 \text{ is } 80\% \cdot 1600 \text{ cm}^2 \times$$

If it fills on day 3

60 cm ²		
100 cm ²	400 cm ²	100 cm ²
400 cm ²	1600 cm ²	400 cm ²
100 cm ²	400 cm ²	100 cm ²

$$400 \cdot 4 + 100 \cdot 4 = 2000 \text{ cm}^2$$

$$2000 \text{ is } 55,5\% \cdot 3600 \text{ cm}^2 \times$$

If it fills on day 4

80 cm		
100 cm ²	600 cm ²	100 cm ²
600 cm ²	3600 cm ²	600 cm ²
100 cm ²	600 cm ²	100 cm ²

$$600 \cdot 4 + 100 \cdot 4 = 2800 \text{ cm}^2$$

$$2800 \text{ is } 41,45\% \cdot 6400 \text{ cm}^2 \times$$

3.

Is it still on day 5

100 m^2	800 m^2	100 m^2
800 m^2	6400 m^2	800 m^2
100 m^2	800 m^2	100 m^2

$$4 \cdot 800 + 4 \cdot 100 = 3600$$

3600 is 36% of 10000

Answer: day 5

1.

The smallest positive integer we can put on the table is ~~black~~ one. The smallest positive number bigger than one is two.

If we devise the table chess-like we see that on any color it does not ~~interfere~~ touch with the same color, so we can use only ones and twos. The goal of the problem by placing each on its own color:

1	2	1
2	1	2
1	2	1

If a board has an even number V (which approx 15) of cells it has the same number of black and white cells

$$100 \cdot 100 = 10000$$

$$10000 : 2 = 5000$$

$$5000 \cdot 1 + 5000 \cdot 2 = 15000$$

Answer: 15000

4. In theory the smallest number of strips is when we use 18 strips $5 \times 7 \times 1$ and $10 \times 6 \times 1$

because: $18 \cdot 7 + 10 \cdot 6 = 132$

after placing ^{some} all of the 7×1 strips

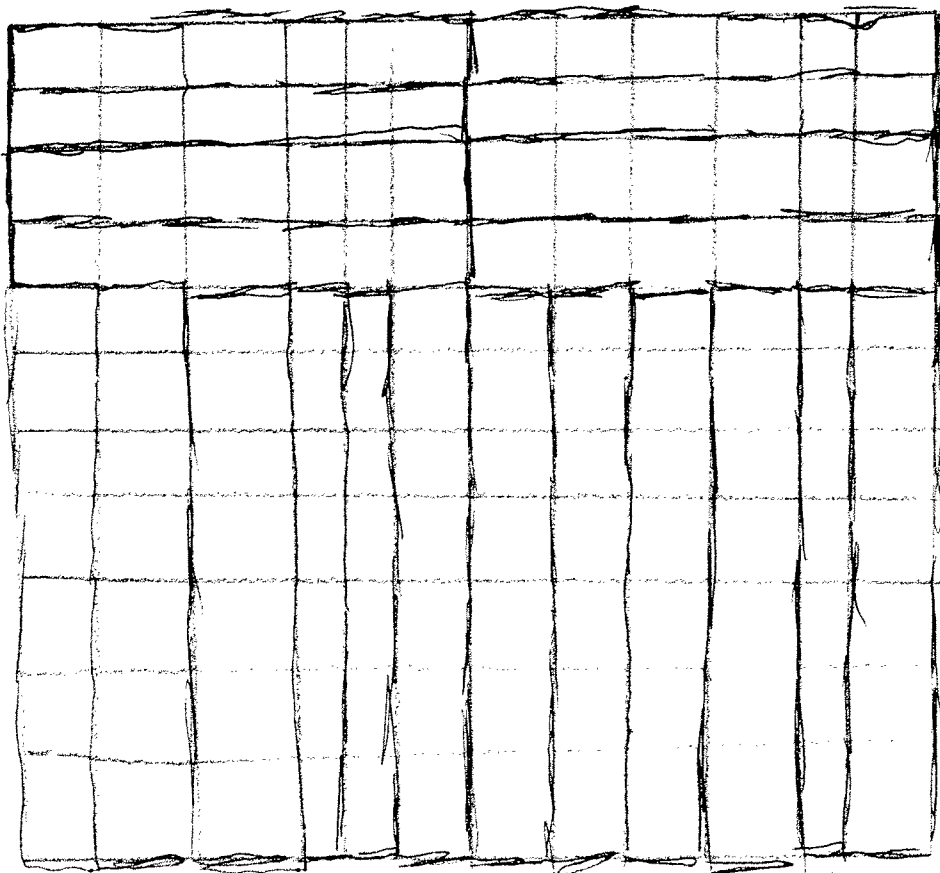
there is no way of placing the 6×1 strip because we cannot put 18 7×1 strips on the board because they can't be put twice in the same column or line.

The next best case will be if

there are 12 of 7×1 strips and 8 of 6×1 strips

because: $8 \cdot 6 + 12 \cdot 7 = 132$

In this case it's possible where each line is a border



$8 + 12 = 20$

Answer: 20

5. If all bags are not in another bag then there should be at least 500 candies. If a bag is another bag then the outer bag's candy could be the same as the bag inside it or any other bag that is inside another bag.

The maximum amount of bags that can benefit from that is 50.

That means that 50 bags are inside a bag and 50 are not.

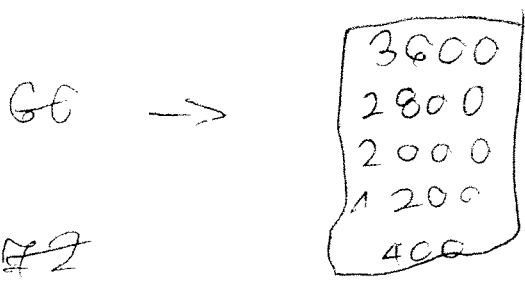
That makes the minimum candy:

$(1 + 2 + 3 + \dots + 50) \cdot 2 = 51 \cdot 25 \cdot 2 = 51 \cdot 50 = 2550$. which is too much, so we need a bag inside a bag inside a bag.

53 → 159 → $\frac{44}{120}$ $\frac{11}{11}$

67 → 201 → 603 → 1206

47 → 141 → 41 123 ~~869~~
 14 42 126 → 252



4x 3200
 4x 1800
 4x 800
 4x 400

↓
~~750~~
 52 25
 150 75
 468 225

74 → 222 → 22 → $\frac{4}{2} \times 400$

66 → 0 51.25

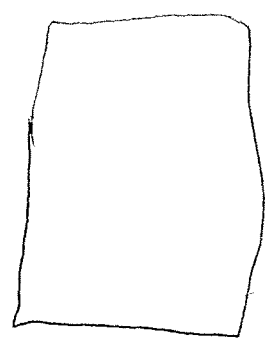
35% = $4x + 1000 \text{ m}^2$
 $4x + 800 \text{ m}^2$
 $4x + 400 \text{ m}^2$

25 75 225 25

$\frac{9}{25}$
~~2800~~
 6400

132
 $\frac{120}{114}$
 108
 102
 96
 90
 84

8100
 3200
 85
 3000



$\frac{1600}{3600}$

$\frac{16}{30}$ $\frac{8}{18}$ $\frac{4}{9}$

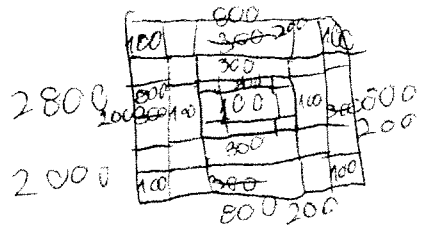
40x40
 1600
 3600
 2000

1600 800 3600
 2000

10x10
 50x50

6400
 2800

0,0625 $\frac{28}{64}$ $\frac{7}{16}$
 0,4175



35% = $4x + 800 \text{ m}^2$
 $+ 4x + 400 \text{ m}^2$

$400 \text{ m}^2 + 4 \cdot 10 \cdot h = 35\%$

$2 \cdot 0 \cdot 10 \cdot h = 40\% + 400 \text{ m}^2$