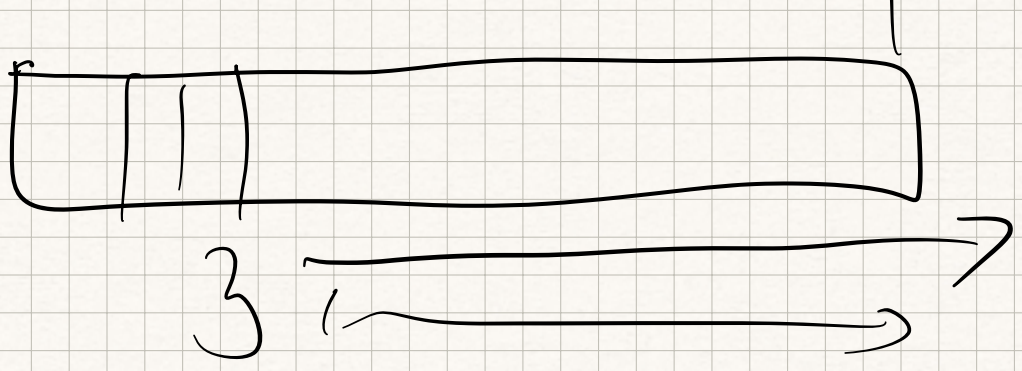
```
def f(T)
    return 2 if m == 0 else
    4 * f(T[m:]) + 2
```

$n \geq 4 \rightarrow n // 4 \geq 1$

$n < 4 \rightarrow n // 4 = 0$

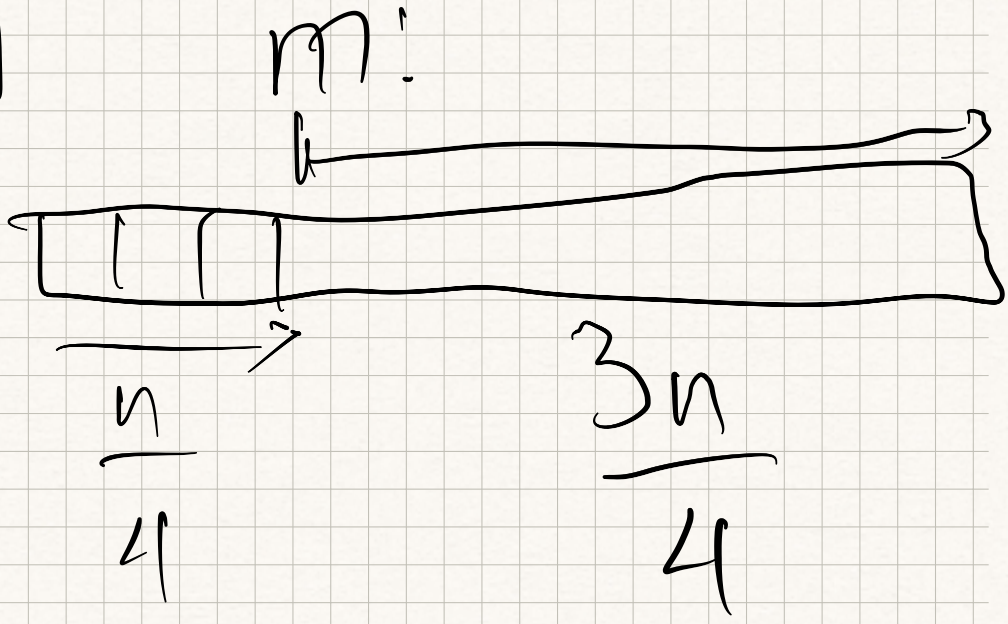
$$A(n) = \begin{cases} 1 & \text{si } n < 4 \\ 1 \times A\left(\frac{3n}{4}\right) + 3 & \end{cases}$$



$T[m]$

$\downarrow$

$\frac{n}{4}$



Θ :

$a = 5$

$b = 4$

$c = 1$

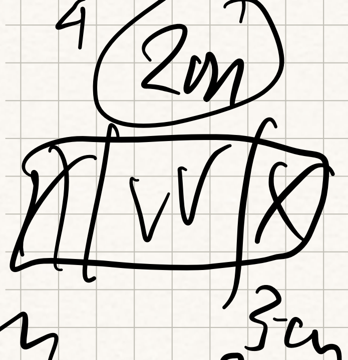
$\log_4(5) \approx 1,1$

Master Théorème

$$A(n) = aA\left(\frac{n}{b}\right) + O(n^c)$$

$$A(n) = \Theta \begin{cases} \Theta(n^c) & \text{si } c > \log_b a \\ \Theta(n^{\log_b(a)} \log n) & \text{si } c = \log a \\ \Theta(n^{\log_b(a)}) & \text{si } c < \log_b(a) \end{cases}$$

$2m = \frac{n^2}{4}$



$2m = \frac{2n}{4}$

$$A(n) = \begin{cases} 1 & \text{si } n \leq 3 \\ 3 * A\left(\frac{3n}{4}\right) + 3 \end{cases}$$

a : nbr d'appel récursive

b : $\frac{n}{b}$

c : l'exposant de n qu'on ajoute en plus dans $3.n^0$

$a = 1$

$b = \frac{4}{3}$

$c = 0$

$\log_{(\frac{4}{3})}(1) = 0$

$\left(\frac{4}{3}\right)^t = 1$

$\Theta(n^{\log_b a} \log n)$ si $c = \log_b(a)$

$\Theta(n^c \log n)$

$= \Theta(n^0 \log n) = \Theta(\log n)$

$$M(n) = \begin{cases} 1 & \text{si } n = 1 \\ 3M\left(\frac{n}{2}\right) + 2n \end{cases}$$

$a = 3$

$b = 2$

$c = 1$

$\log_b(a)$ c

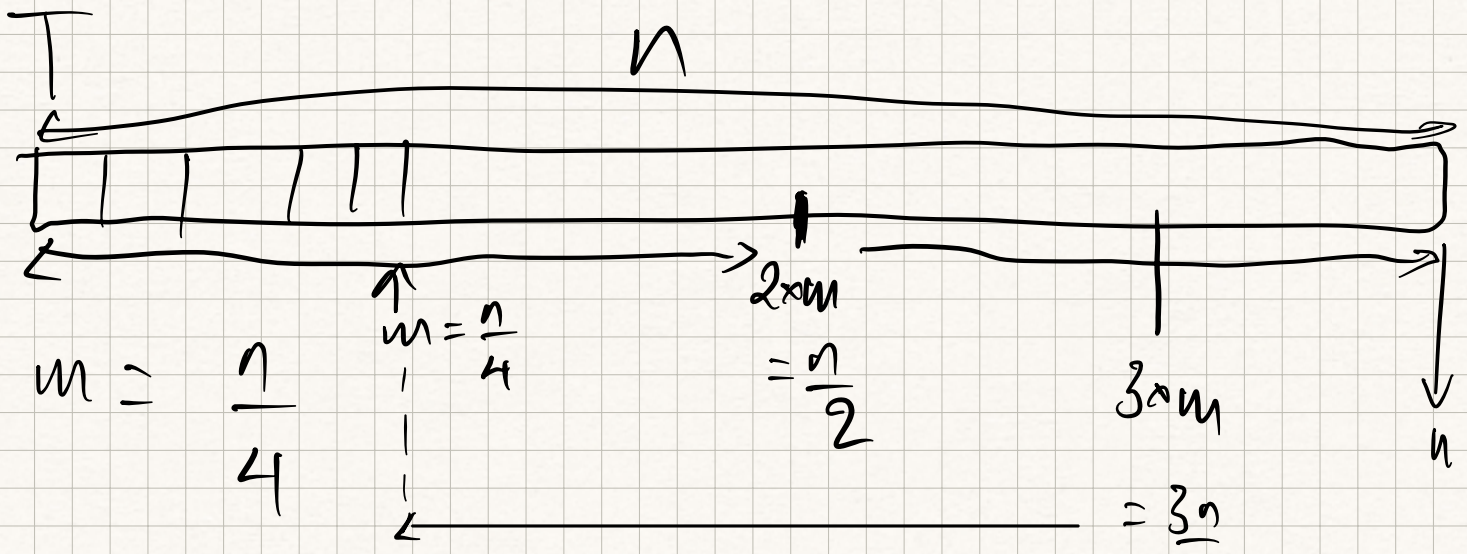
$2^{\log_2 3} = 3 > 2^1 = 2$

$2^{\log_2 3} = 3 > 2^1 = 2$

Donc $M(n) = \Theta(n^{\log_2 3})$

$\log_2 3 = \frac{\ln(3)}{\ln(2)}$

$\ln(2) < \frac{\ln(3)}{\ln(2)} < \ln(3)$



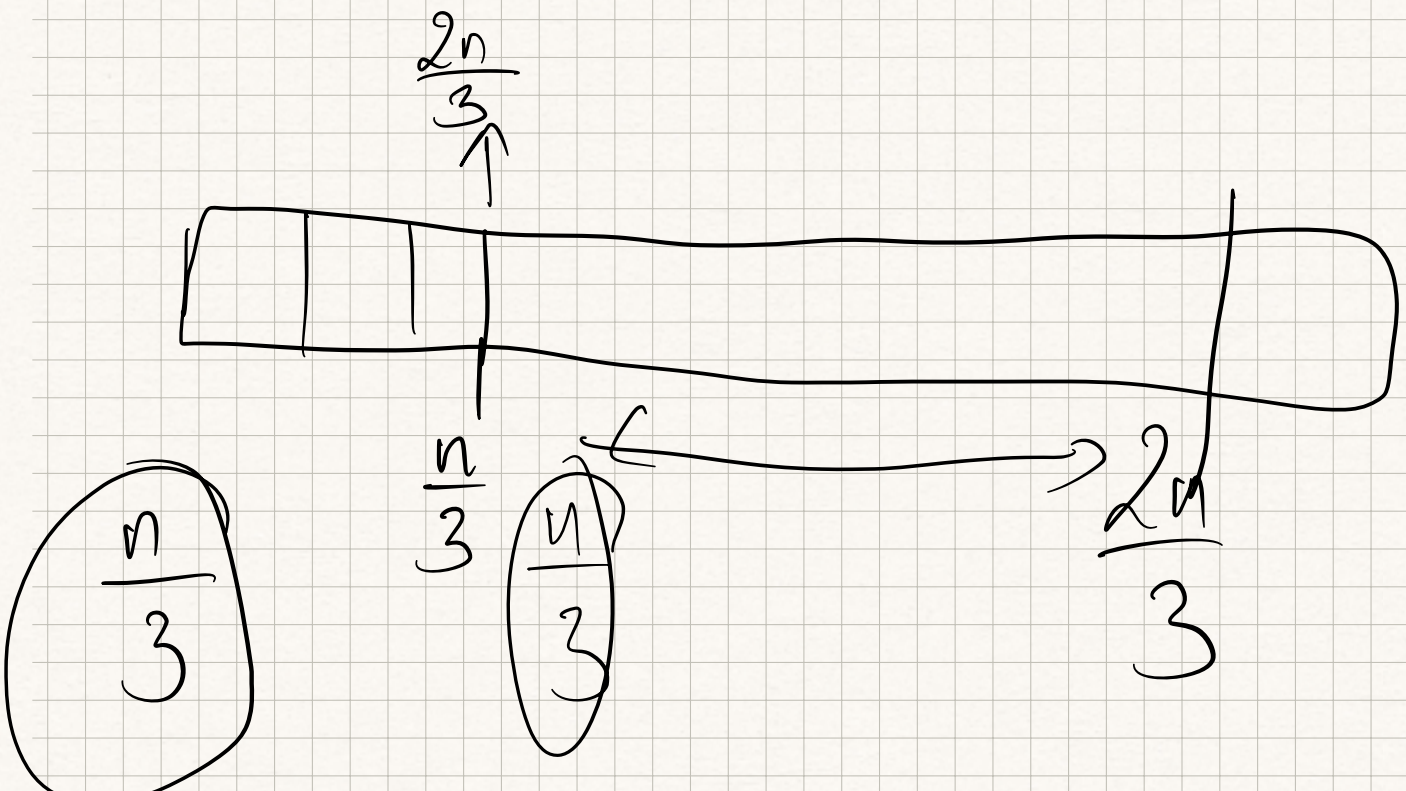
$m = \frac{n}{4}$

$T_1 = T[2 \cdot m :]$

$T_2 = T[:2 \times m]$

$$A(n) = \begin{cases} 1 & Si \quad n = 0 \\ 3\,A\left(\frac{n}{2}\right) + n^{1} + 5 \end{cases}$$

a b c



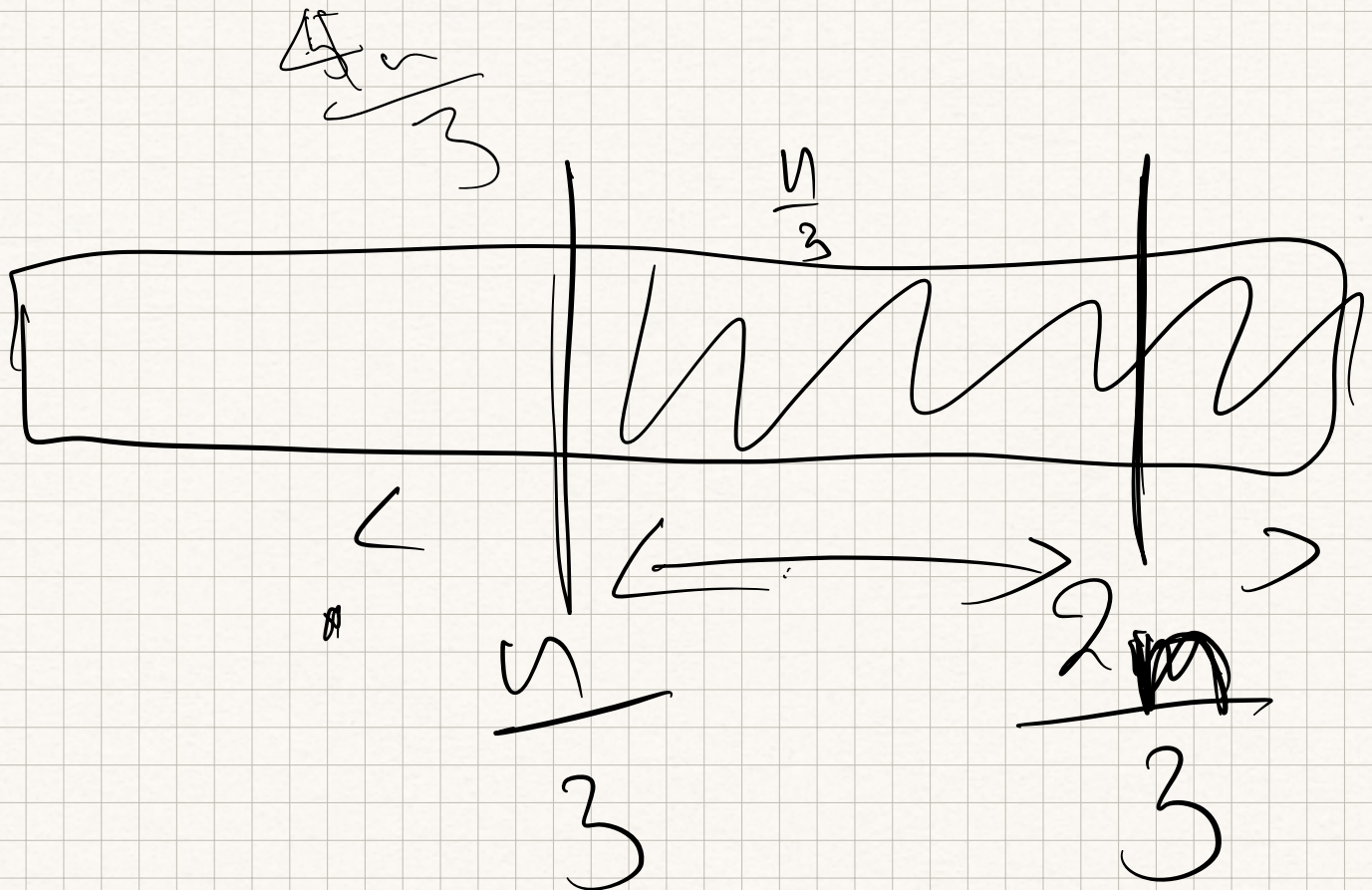
$\frac{n}{3}$ $\frac{n}{3}$ $\frac{n}{2} + 2n$

$\frac{n}{3}$

$\frac{n}{4}$ $\frac{3n}{2}$ $\frac{3n}{4}$

$\frac{n}{2}$ $\frac{n}{2}$ $\frac{3n}{2}$

n/3 2n/3 n/3



$T[2^4 m :]$ $\quad \frac{3n}{3} - \frac{2n}{3} = \frac{n}{3}$

$m = \frac{n}{3}$

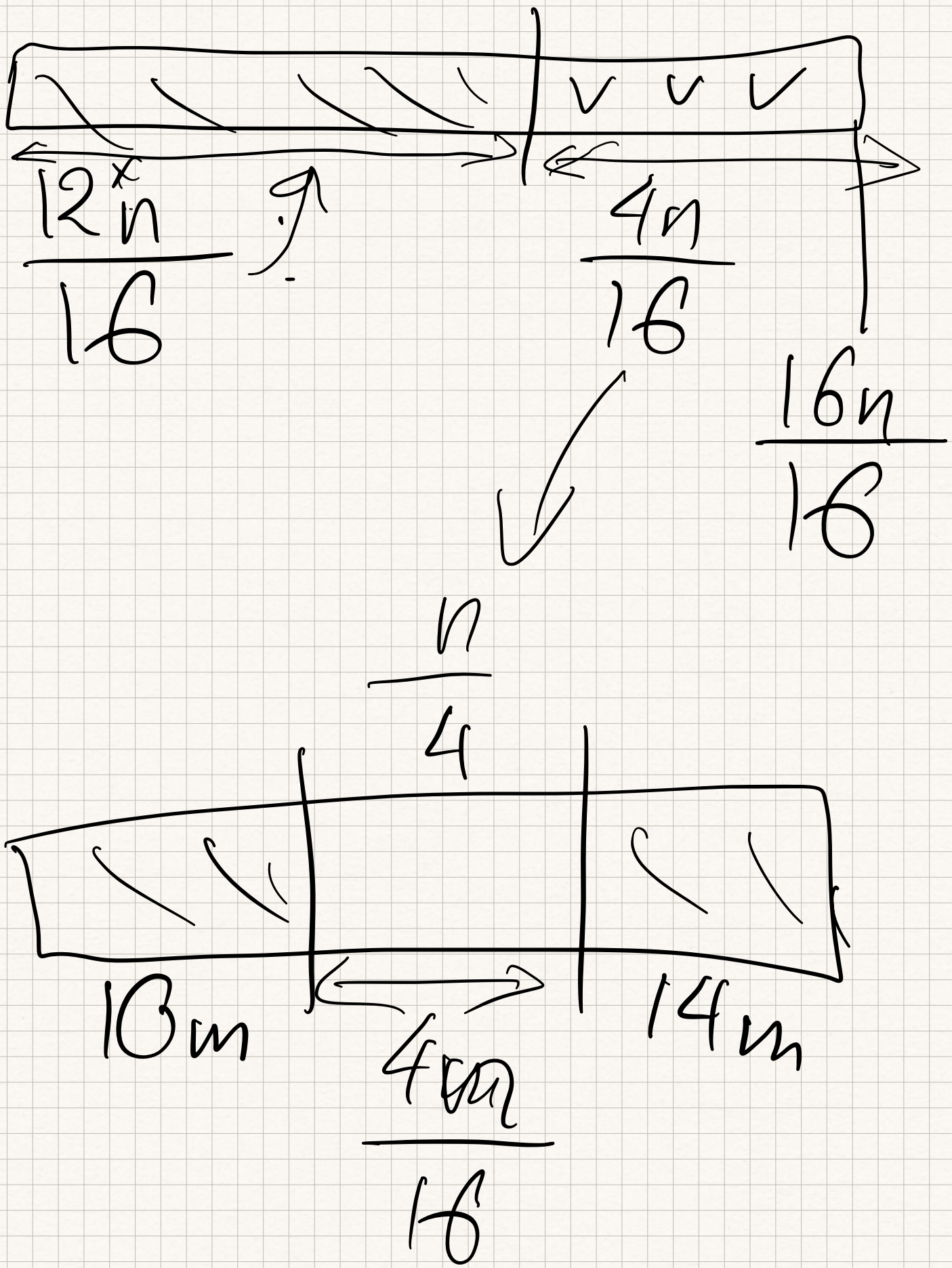
3

$T[:m]$

$4\frac{n}{4} - \underline{2m}$

$\underline{m} = \frac{n}{4} \quad \frac{1}{2}$

$\frac{2}{n} \qquad \frac{1}{2}$


12m/16
4m/16
16m/16
m/4
10m
4m/16
14m

$$\sigma = \begin{pmatrix} 5 & 8 & 7 & 2 & 3 & 6 & 1 & 4 \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \end{pmatrix}$$

π

pas 1 $\to$ 5

$5 \to 3$

$3 \to 7$

$7 \to 1$

$$(1\ 5\ 3\ 7)$$

pas 2 $\to$ 8

$8 \to 4$

$4 \to 2$

$$(2\ 8\ 4)$$