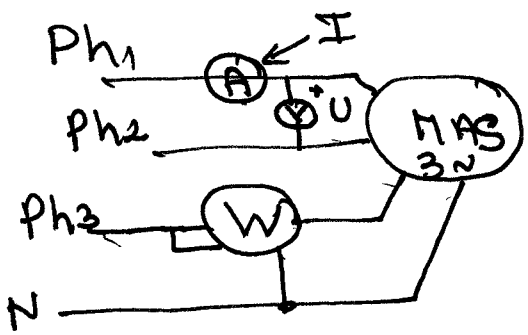
Exercice1

1°/ $U_{réseau} = 400V \Rightarrow V_{réseau} = \frac{U_{rés}}{\sqrt{3}} = \frac{400}{\sqrt{3}} = 230V$

$U_{mot} = 230V = V_{réseau} \Rightarrow$

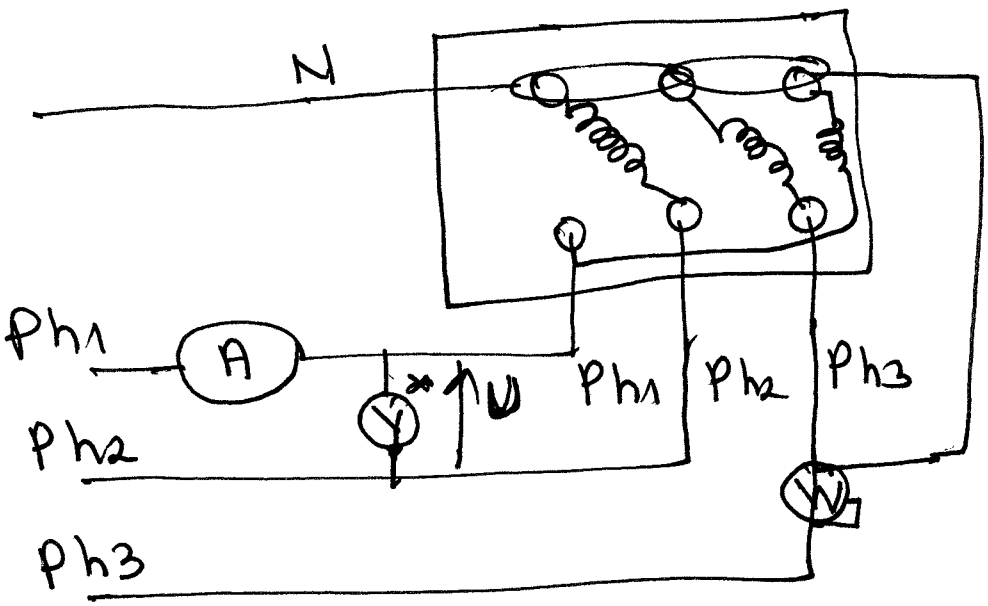
le Stator sera couplé en étoile

2°/



$P_a = 3 \times L$

L: la lecture indiquée par Wattmètre



3°/ $n_s = \frac{f}{p}$ $p = 2$ Car moteur tétrapolaire

$n_s = \frac{50}{2} = 25 tr/s = 25 \times 60 = 1500 tr/min$

4°/ $g = \frac{n_s - n}{n_s} = \frac{1500 - 1420}{1500} = 0,053 = 5,3\%$

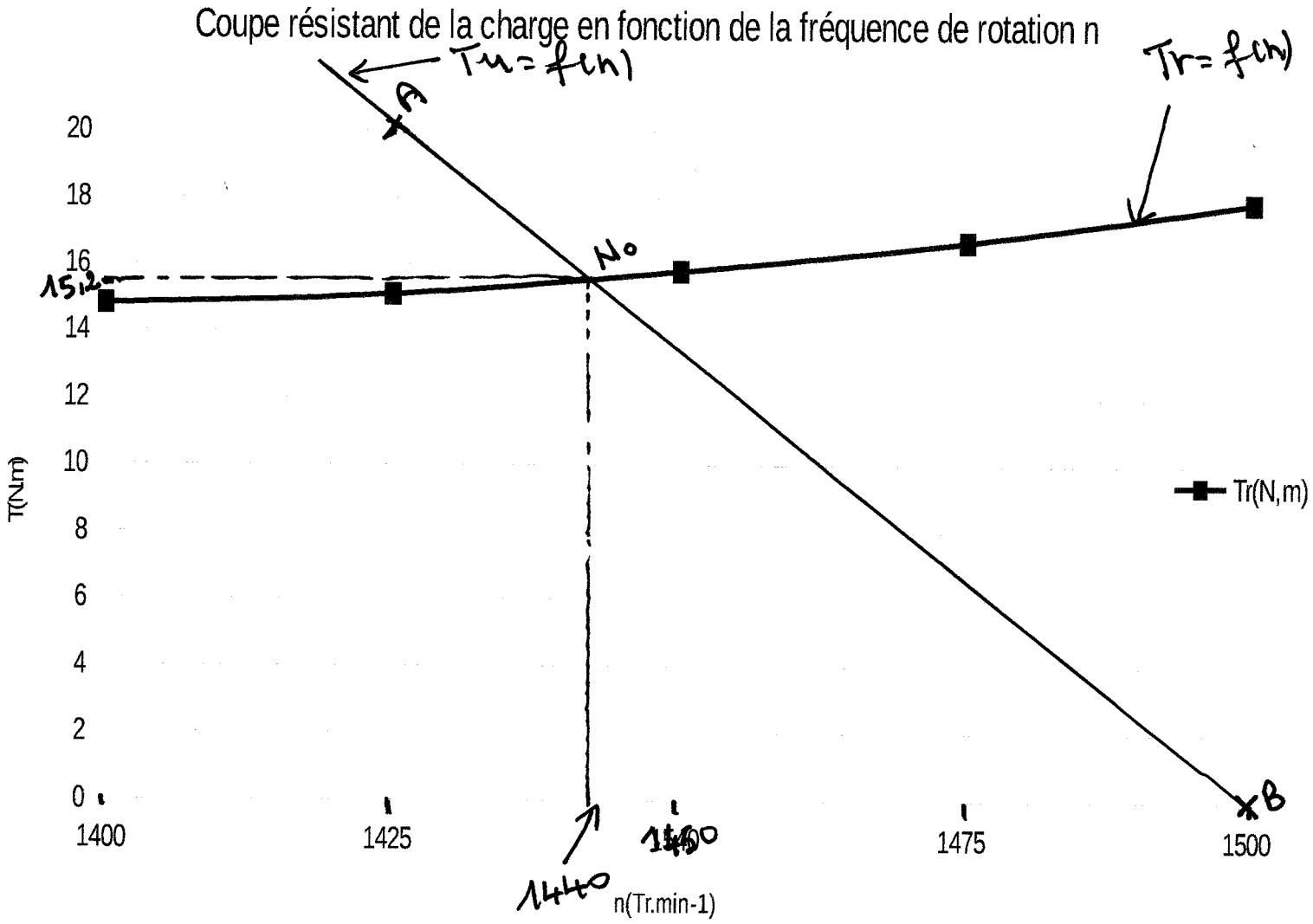
5°/ $k_m = \frac{P_a}{S} = \frac{P_a}{UI\sqrt{3}} = \frac{3750}{400 \times 6,5 \times \sqrt{3}} = 0,833$

6°/ $\eta = \frac{P_M}{P_a} \Rightarrow P_M = \eta \times P_a = 0,86 \times 3750 = 3225W$

7°/ $T_M = P_M / \Omega = P_M / 2\pi n/60 = 3225 / (1420 \times \frac{2\pi}{60}) \approx 21,7 Nm$

Exercice 2

1°/ A : (n=1425 ; Tu=20) ; B : (n=1500 ; Tu=0)



le point d'intersection entre la caractéristique Tr=f(n) et celle du moteur Tu=f(n) donne le point de fonctionnement : No : $T_a = 15{,}2\ Nm$; $n_o = 1440\ tr.min^{-1}$

2°/ $P_u = T_u \times \Omega = 15{,}2 \times 2\pi \frac{n}{60} = 15{,}2 \times 2\pi \times \frac{1440}{60}$

$$\boxed{P_u = 2292\ W}$$

$$g = \frac{n_s - n}{n_s} = \frac{1500 - 1440}{1500} = 0{,}04 = 4\%$$

3°/ $P_a = U \cdot I \sqrt{3} \cos\varphi = 400 \times 5{,}8 \times \sqrt{3} \times 0{,}8 = 3215\ W$

$\eta = P_u / P_a = 2292 / 3215 = 71{,}3\%$