

# Ejercicio N° 2/1

XX Abril 2020

Tomando los datos del ejercicio anterior, componer analíticamente.

Ecuaciones de las (R.A.)

$$P_1 = 100 \text{ N}; P_2 = 150 \text{ N}$$

$$P_3 = 120 \text{ N}; P_4 = 200 \text{ N}$$

$$Y_1 = -2,33x + 21,67 \text{ m}$$

$$Y_2 = 0,554x + 5 \text{ m}$$

$$Y_3 = 4 \text{ m}$$

$$X_4 = 3 \text{ m}$$

Ángulos de las (R.A.)

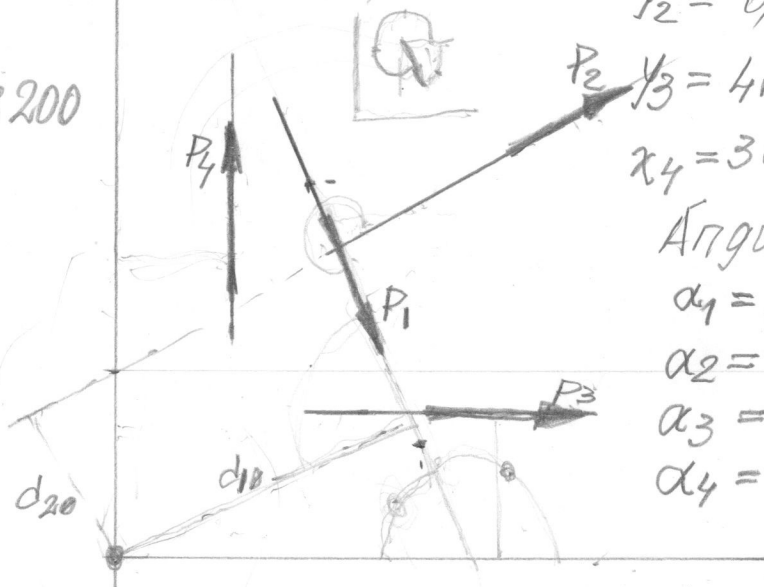
$$\alpha_1 = 113,8^\circ \quad (66,8^\circ) \text{ (1er cuadr.)}$$

$$\alpha_2 = 29^\circ$$

$$\alpha_3 = 0^\circ$$

$$\alpha_4 = 90^\circ$$

1:200



$$\sum P_y = R_y$$

$$P_{1y} = 100 \text{ N} \sin 66,8^\circ = 91,9 \text{ N}$$

$$P_{2y} = 150 \text{ N} \sin 29^\circ = 72,7 \text{ N}$$

$$P_{3y} = 120 \text{ N} \sin 0^\circ = 0 \text{ N}$$

$$P_{4y} = 200 \text{ N} \sin 90^\circ = 200 \text{ N}$$

$$R_y = 180,8 \text{ N}$$

$$\sum P_x = R_x$$

$$P_{1x} = 100 \text{ N} \cos 66,8^\circ = 39,4 \text{ N}$$

$$P_{2x} = 150 \text{ N} \cos 29^\circ = 131,2 \text{ N}$$

$$P_{3x} = 120 \text{ N} \cos 0^\circ = 120 \text{ N}$$

$$P_{4x} = 200 \text{ N} \cos 90^\circ = 0 \text{ N}$$

$$R_x = 290,6 \text{ N}$$

$$R = \sqrt{R_y^2 + R_x^2} = \sqrt{(180,8 \text{ N})^2 + (290,6 \text{ N})^2} \approx 341,9 \text{ N}$$

$$\alpha_R = \text{tg}^{-1}(180,8 \text{ N} / 290,6 \text{ N}) \approx 31,9^\circ$$

Tomando momentos respecto al origen de los ejes:

$$d_{10} = 21,67 \text{ m} \cos 66,8^\circ = 8,54 \text{ m}$$

$$d_{20} = 5 \text{ m} \cos 29^\circ = 4,37 \text{ m}$$

$$d_{30} = 4 \text{ m} \cos 0^\circ = 4,00 \text{ m}$$

$$d_{40} = 3 \text{ m} \sin 90^\circ = 3,00 \text{ m}$$

$$M = (+)$$

$$\sum M_{\text{origen}} = 100 \text{ N} \cdot 8,54 \text{ m} + 150 \text{ N} \cdot 4,37 \text{ m} + 120 \text{ N} \cdot 4 \text{ m} - 200 \text{ N} \cdot 3 \text{ m} \approx 1390 \text{ Nm}$$