A 100N weight rest on a 30 degrees inclined plane. Neglecting friction, how much pull must one exert to bring the weight up the plane?

Solution:

$\mathrm{mg} = 100\mathrm{N} -$ weigth of the body;

$\alpha = 30° -$ angle of the plane with the horizontal;

The first law of equilibrium along the X axis:

$$F - mg_x = 0$$

$$F = mg_x \qquad (1)$$

From the right triangle ABC:

$$\sin\alpha = \frac{mg_x}{mg};\ mg_x = mg \cdot \sin\alpha \qquad (2)$$

$(2)\mathrm{in}(1)$:

$$F = mg \cdot \sin\alpha = 100\mathrm{N} \cdot \sin 30° = 100\mathrm{N} \cdot 0.5 = 50\mathrm{N}$$

Answer: to bring the weight up the plane we must act with the force bigger than $50\mathrm{N}$.