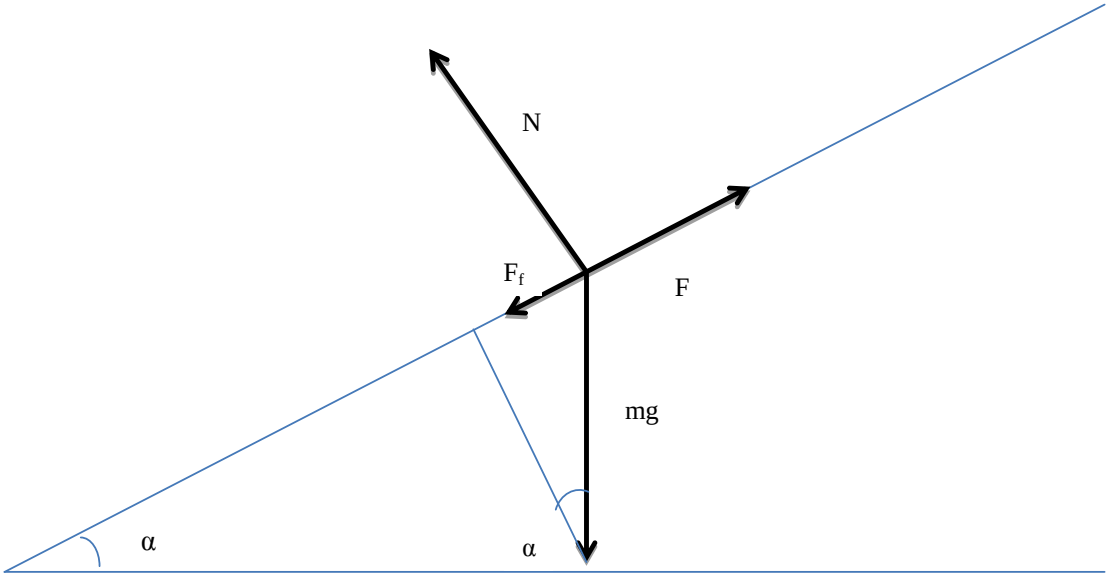
a 20kg wagon is pulled along a level ground by a rope inclined at 30 degrees above the horizontal.a friction force of 30 newtons opposes the motion.how large is the pulling force of the wagon is movin at constant speed



$\alpha = 30^O$

$mg = 9.8 \cdot \frac{m}{s^2} \cdot 20kg = 196N$

$F_{fr} = 30$ - force of friction

F - force of pulling

From Newton's first law of motion:
If there is no net force on an object, then its velocity is constant.
So, vector sum of forces equals 0.
Therefore:

$F_{fr} + m \cdot g \cdot \sin\alpha = F$

$F = 30N + 20kg \cdot 9.8\frac{m}{s^2} \cdot \sin 30^O = 30N + 20kg \cdot 9.8\frac{m}{s^2} \cdot \frac{1}{2} = 128N$

Answer:
The pulling force of the wagon is $F = 128N$