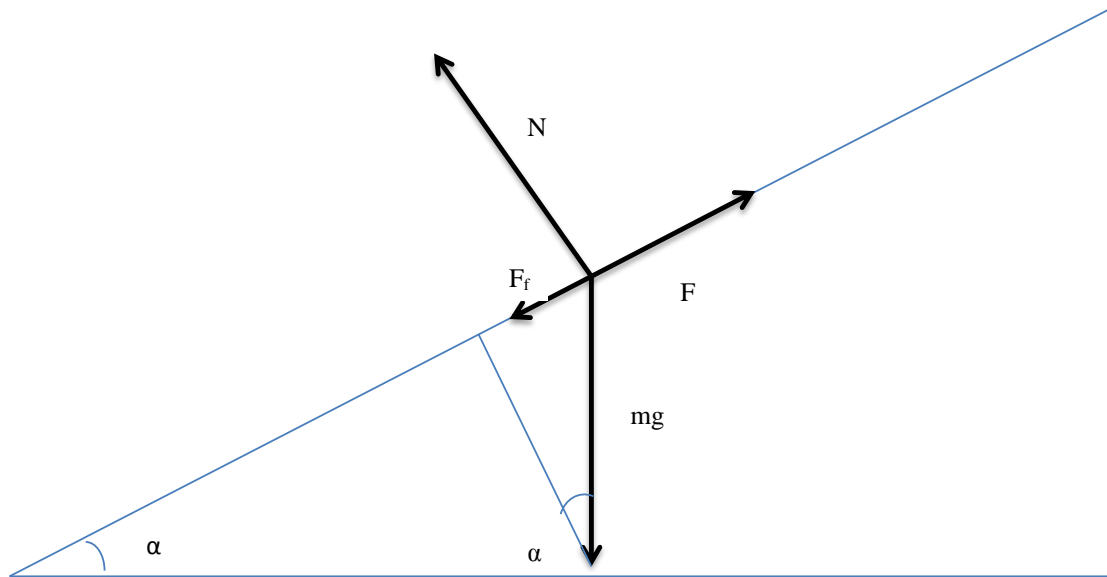If I am pulling a bag with a force of 25 N and the bag is on an angle of 32 degrees from the ground and the bag has a 2 kg weight, what is the coefficient of kinetic friction between the bag and the ground?

$\alpha = 32$

$mg = 9.8 \frac{m}{s^2} \, 2 \, kg = 19.6 \, H$

$F = 25 \, H$ - force of pulling

$F_r -$ force of friction

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.

$\mu (or \ k) = F_f / N$ - the coefficient of kinetic friction between the bag and the ground

Therefore:

$F_f + mg \sin \alpha = F \quad => \quad F_f = F - mg \sin \alpha$

and:

$mg \cos \alpha = N \quad => \quad N = mg \cos \alpha$

$\mu(k) = \frac{F_f}{N} = \frac{F - mg \sin \alpha}{mg \cos \alpha} = \frac{25 - 19.6 \sin 32}{19.6 \cos 32} = 0.88$

Answer: the coefficient of kinetic friction between the bag and the ground equals 0.88