A donkey pulls a loaded cart on tracks with a force o 213N. If he rope is 5.20m long and the donkey's path is 1.30m offset from the tracks, determine the acceleration of the 117kg cart against friction of 200N.

$F=ma$

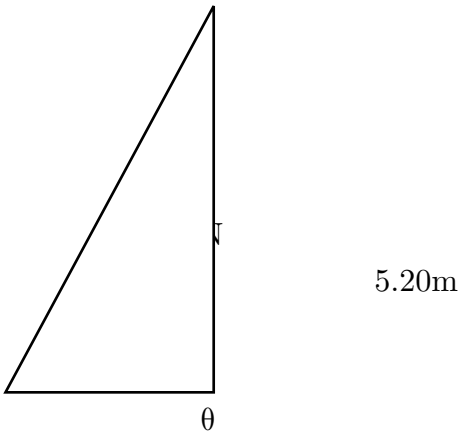
$\theta = \tan^{-1}(\frac{5.20}{1.30}) = 75.96$

$\sin\theta = \frac{F_{\text{¿}}}{213}$

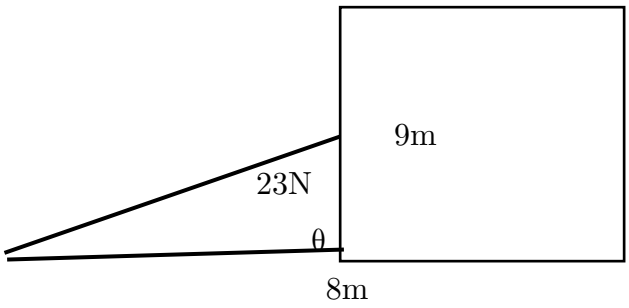
$F_{parallel} = \sin(75.96) \text{ x } 213 = 206.64$

$F_R = 206.64 - 200 = 6.64$

$a = \frac{F}{m} = 0.0568 ms^{-2}$




Ike is trying to pull a 10m cube of stone (2.75Gg) using a 9.00m rope attached to the centre of one face. Ike pulls with 313N from 8.00m in front of the block against 290N of friction. Explain why the cube doesn't move. Support your answer with calculations and a diagram.




$\theta = \cos^{-1}(\frac{8}{9}) = 27.3$

$\cos\theta = \frac{F_h}{313} \rightarrow F_h = 313\cos(27.3) = 278N$

$278 > 290$

The vertical component of his pulling force is wasted pulling the block into the ground. Only the horizontal component can take effect but it's less than the friction, so no movement occurs.