



DEPARTMENT OF PHYSICS
S4 CONTINUOUS ASSESSMENT 2024
TIME ALLOWED: $1\frac{1}{2}$ Hrs

Where necessary assume the following;
Acceleration due to gravity, $g = 10 \text{ ms}^{-2}$

1. Juma is one of the workers on a construction site at Roko. Juma carries 3 bricks each of mass 1.5kg through a staircase of 45 steps each 16 cm high. Determine the energy expended by Juma to carry the bricks through the staircase.
The manager later notices that Juma is exhausted. He then asked Juma to decide whether to buy a single fixed pulley or a single movable pulley to ease his work. Help Juma to provide an explanation for the best choice of pulley.
A truck of cement then arrived at the site, Determine the work done to offload a bag of cement of 50kg on a plank of wood of length 5m as shown in the figure 1. Where else can we apply pulleys in our daily life.

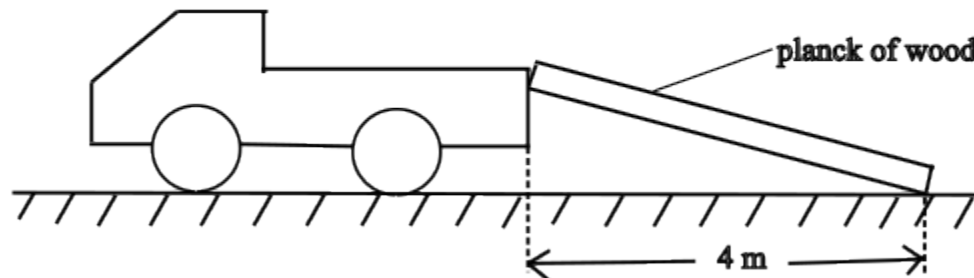


Figure 1: A truck loaded with bags of sand

2. A trader at Arua park opens a wide gate from a point A and closes it from the end B as shown in the figure 2. The trader realizes that opening the gate from point A is easy compared to closing the gate at point B. Explain the trader's experience at the gate.
He continued to the shop but did not have a weighing balance. The trader used a uniform beam of mass 1.5 kg of length 1 m to determine the mass of the remaining sugar. The beam balanced with the pivot at 70 cm and the sack of sugar at 90 cm . Help the trader determine the mass of sugar.
The trader later observed a bus being loaded at the base. why is it necessary to load a bus at the base. Explain how a similar reason is applied in the design of racing cars.

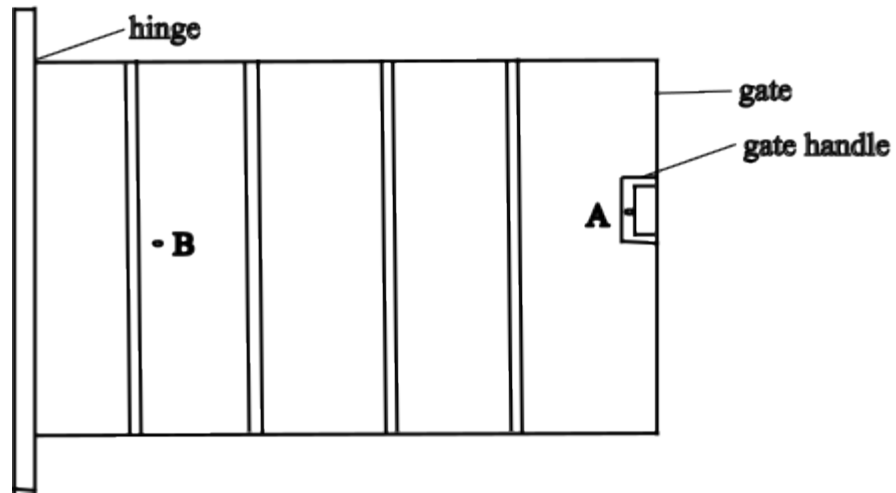


Figure 2: The gate opened by the trader