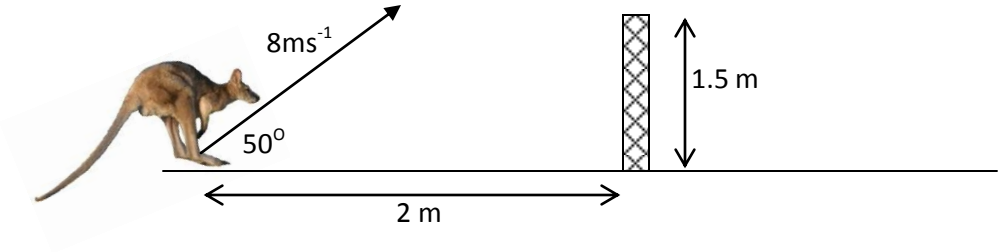
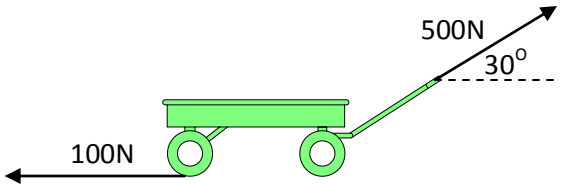
Higher Physics Assessment 003

1. A kangaroo runs at a fence in order to escape from an enclosure. The kangaroo jumps into the air with a velocity of 8 ms^{-1} at an angle of 50^{O} at a distance of 2m from the base of the fence which is 1.5 m high.



   a. Calculate the vertical component of the initial velocity of the kangaroo.
   b. Calculate the horizontal component of the initial velocity of the kangaroo.
   c. Show that it takes the kangaroo 0.4 seconds to reach the base of the fence.
   d. By finding the height of the kangaroo at this time show by calculation whether it cleared the fence or not.

2. A 50 kg trailer is pulled with a force of 500 N at an angle of 30^{O} to horizontal as shown below. The force of friction acting on the trailer is 100 N.



   a. Calculate the horizontal component of the 500N force.
   b. Find the unbalanced force acting on the trailer.
   c. Calculate the acceleration of the trailer
   d. If the trailer is pulled from rest a distance of 20m with this acceleration then calculate the trailers velocity at the end of the 20m.