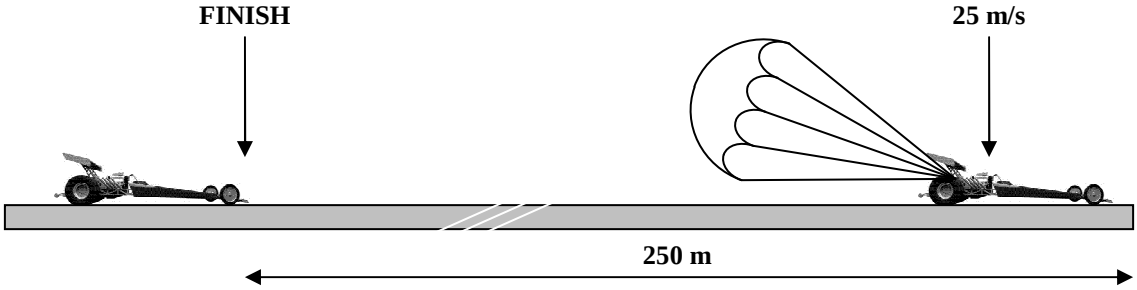
Kinetic Energy/Work-Energy theoreme

8. A *50 kg* box is dragged *30 m* on a horizontal floor, applying a *F = 100 N* exerted by a person. Such force acts doing a *60º* angle. The *coefficient of kinetic friction is 0.2*. Calculate: a) The *work* done for each one of these *forces F, the friction, the weight and the normal*. b) The *net work* done on the box. ***A: a) ..... b) 1760 J.***

9. What is the *kinetic energy* of a *25 g* dart that is thrown at *20 m/s*?. ***A: 5 J.***

15. An *900 kg* dragster finishes the race with some u*nknown velocity*. A parachute is deployed after crossing the finish line and exerts a stopping force of *20,000 N* across a distance of *250 m* before the dragster slows down to *25 m/s*. What was the *speed* of the dragster when it passes the *finish line*. ***A: 111 m/s***



16. A bullet, *20 g*, is shot through a piece of wood. The bullet enter the wood at *600 m/s*. The wood is *7 cm* thick. The wood exerts *15,000 N* of force to slow the bullet down. *How fast is the bullet* traveling when it leaves the piece of wood on the *opposite side*? ***A: 505 m/s.***

17. A musket ball, 0.22 kg, is shot with a speed of *300 m/s* into a metal can holding some clay. The musket ball penetrates *15 cm* into the clay before coming to a stop. a) What is the *kinetic energy* of the musket ball before it hits the clay if its mass is 0.22 kg? b) How much *work* does the clay do in stopping the musket ball? c) What *average force* does the clay exert in stopping the musket ball? d) Calculate the *speed of the musket* ball when it has penetrated the clay only *5 cm*. ***A: a) 9900 J. b) ..... c) 66000 N. d) 261 m/s***

18. A *20 kg* box is given an initial speed of *10 m/s* along a horizontal surface with a coefficient of kinetic friction of *0.2*. *How far* will the box slide before coming to rest? Do not use the kinematic equations of motion. ***A. 25.5 m***

19. A *1000 kg* car coasts from rest down a driveway that is *inclined 25º* to the horizontal and is *16 m* long. How fast is the car going at the end of the driveway if a *friction of 3000 N* opposes the motion? ***A: 3.35 m/s.***