Reminders 9-29-10:

-Quiz Today on Chapter 4

-Force Questions (see BlackBoard) Due Monday

-Extra Credit to Replace lowest Quiz Score Turn in "Identifying Forces Worksheet" by Monday at Beginning of Class ONLY (You must follow the given instructions)

-Turn in "Work" Worksheet Wednesday October 6

-Exam 2 Ch 4-6 Mon. Oct. 18

Objectives:

-Work

-Kinetic Energy

-Work Kinetic Energy Theorem

-Potential Energy

-Quiz

Example

Your team of furniture movers wishes to lo
using a ramp from the ground to the back e
the truck. A worker claims that less work w
required to load the truck if the length of th
were increased since it reduces the angle it
the horizontal. The ramp helps because

A. the work is the same but the force decrea
B. the work increases but the force stays the
C. the work decreases but the force increase
D. the work is the same but the force increa
E. the work decreases and the force decreas

- **Suppose a horse pulls a cart with a force of 400 N. What is the work done on the cart after it has traveled 11 m in 5 seconds.**

$W = Fd\cos\theta$

$\theta = 0 \quad \cos 0 = 1$

$W = (400\,N)(11\,m) = 4400\,J$

$P_{avg} = \frac{4400\,J}{5\,s} = 880\,W$

$= Fv = (400\,N)\left(\frac{11\,m}{5\,s}\right)$

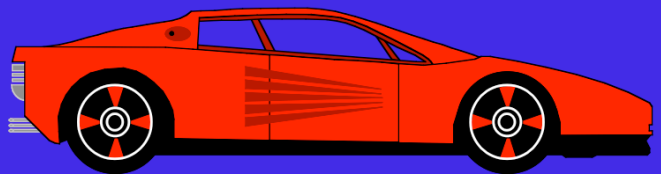
$= (400\,N)\left(2.2\,\frac{m}{s}\right)$

Work and Energy

- The quantity v in $(1/2)mv^2$ is the magnitude of the velocity vecto

$$v = \sqrt{v_x^2 + v_y^2}$$

– Suppose a car has a mass of 1000 kg and is traveling at the rate of 20m/s, what is the kinetic energy of the car? What happens if its speed is tripled?halved?



$KE = \frac{1}{2}mv^2$

$= \frac{1}{2}(1000\,kg)\left(20\,\frac{m}{s}\right)^2$

$= 200{,}000\,J$

If v is tripled, then KE increases by factor of 9.

If v is halved, then KE decreases by factor of 4.

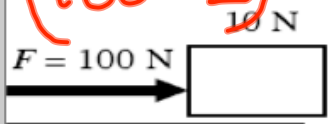
weights of the boxes and the applied horizontal force for each case are given in the indicated fi
frictional force is 20% of the weight of the box (g = 10 N/kg).

Rank the change in kinetic energy for each box from the greatest change in kinetic energy t
change in kinetic energy. All boxes have an initial velocity of +10 m/s (+ direction is to the rig
he left, with –4 < -2).

(100 - 2) = 98 N

48 N

98 N



A

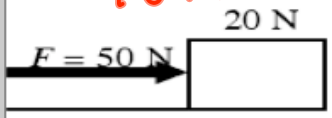
B

C

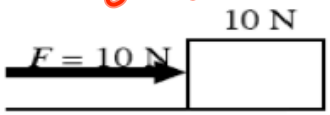
46 N

8 N

6 N



D



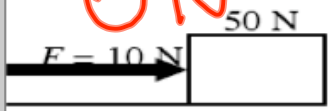
E

F

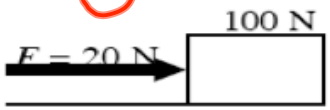
0 N

0

Look for object with biggest net force



G

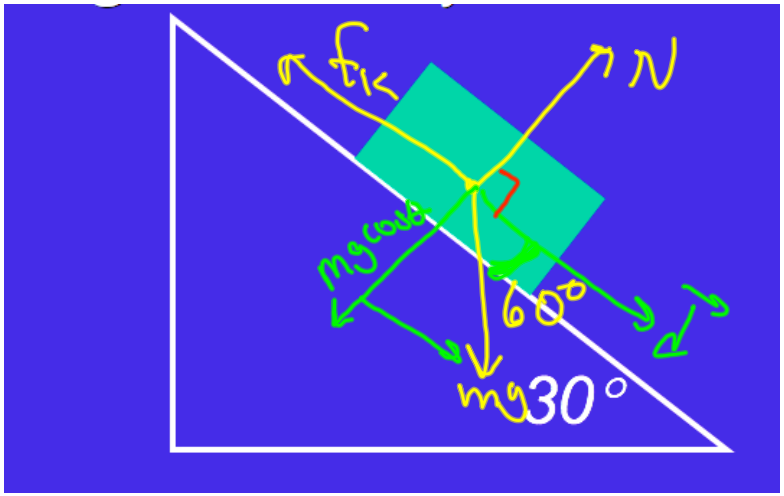


H

Greatest 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ Least

Or all changes in kinetic energy are the same

A, C, B, D, E, F, G H



$$W_{NET} = \Delta KE$$

$$W_N + W_g + W_f = \Delta KE$$

$$0 + |mg||d|\cos 60° + d\mu_k N \cos 180$$

$$(5.0\,kg)\left(9.80\frac{m}{s^2}\right)(2.5\,m)\cos 60° + .2(5.0)(9.80)(2.5)\cos 180$$

$$W_{net} = 40\,J = \Delta KE$$