1

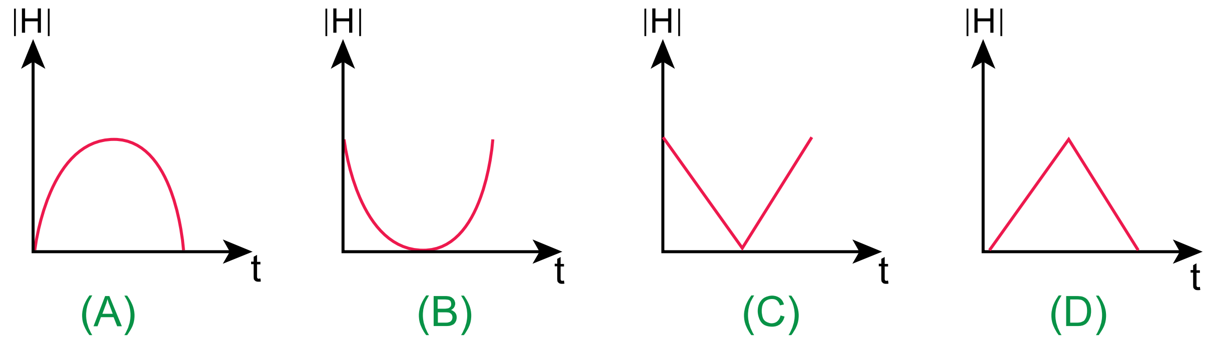
A particle moves in a straight line where its position vector $\vec{X}$ (meter) is given as a function in the time t (sec.)

by the relation $\vec{X}$ = cos t $\vec{C}$ where $\vec{C}$ is a unit vector in the direction of motion of the body.

Then the body passes through the origin point for the first time after time...........sec

- $\frac{\pi}{2}$
- **1**
- $\frac{1}{2}$
- π

2

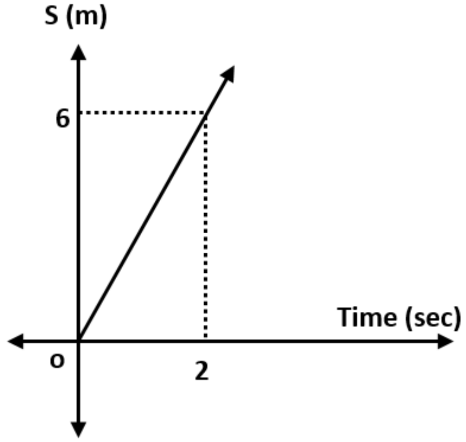


A body of constant mass is projected up with a certain velocity,

which of the graphs represents the relation between the magnitude of the momentum of the body |H| and the time t during its motion?

- **C**
- **A**
- **B**
- **D**

3



The opposite figure represents the (displacement-time) graph for a body of mass 3 kg

moving in a straight line , then the change in the momentum of the body during the time interval [1,3] equals .... Newton. sec

- **0**
- **3**
- **6**
- **9**

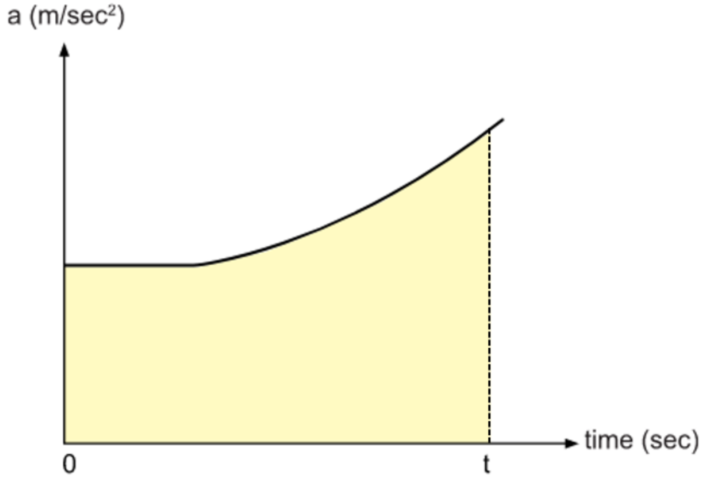
4

A particle moves in a straight line, its momentum changes by the rate 2t kg. m/sec^2 where t is time in seconds, then the magnitude of the impulse of the force acting on this particle during the tenth second = ……. Newton. Sec

- 19
- 17
- 20
- 21

5

The opposite figure represents the (acceleration-time)



graph of a body of mass 2kg moving in a straight line, then the impulse of this force during the interval [0, t] seconds = ...

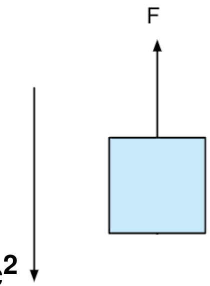
- **Twice the area of the shaded part**
- **Three times the area of the shaded part**
- **The area of the shaded part**
- **Half the area of the shaded part**

6

A force $\vec{F}$ of magnitude 7.5 kg.wt acts upon a body and moves it in a straight line, if the velocity of the body at a certain moment is 36 km/h, then the power resulted from the force at this moment CAN NOT EQUAL ....

- **80 kg.wt.meter / sec**
- **735 watt.**
- **50 kg.wt.meter/sec**
- **700 watt.**

7



A body of mass m kg is moving vertically downward with acceleration 1 m/sec^2 under the action of a force acting vertically upward of magnitude 10kg.wt, and against resistance of magnitude 10N, then m =..........kg

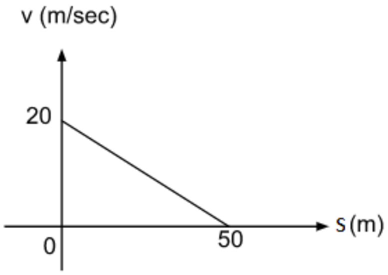
- $\frac{135}{11}$
- $\frac{220}{27}$
- $\frac{245}{22}$
- 10

8

A particle moves in a straight line such that its velocity (v) is given by the relation: $v^2+x^2=25$, where x is the position of the particle, a is the acceleration, then............

- $v^2+a^2=25$
- $a^2+x^2=25$
- $v^2+a^2=0$
- $a^2+x^2=0$

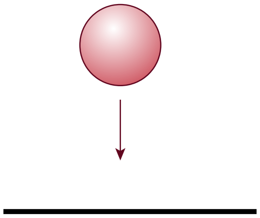
9



The opposite figure represents the (velocity - displacement) graph for a body moves in a straight line, then its acceleration (a) when the displacement vanishes =..........m/sec^2

- **- 8**
- **8**
- **- 20**
- **20**

10



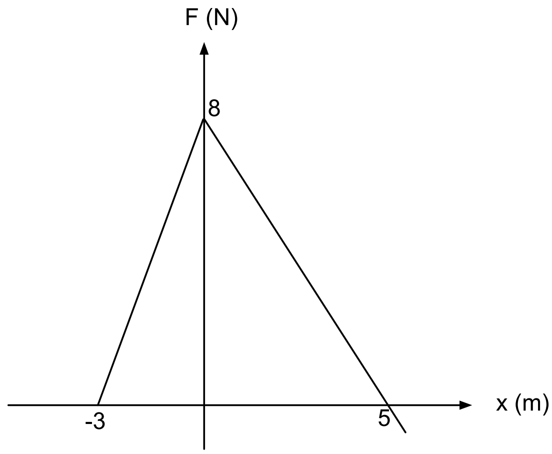
When a body of constant mass fell down from a certain height on a horizontal ground,

then the impulsive force generated at the moment of contact F $\propto$ .... (t is the contact time).

- $\frac{1}{t}$
- **t**
- t^2
- $\frac{1}{t^2}$

11

The opposite figure represents the (force-position) graph of a body moves in a straight line starting



from the position x = - 3, then the position of the particle (x) when the work done by the force = - 148 joule is x =.........m

- **20**
- **13**
- **17**
- **10**

12

A body at rest of constant mass, a force is acting on it to move it in a straight line with a constant acceleration (*a*), then the power of this force during time (t) is proportional with.............

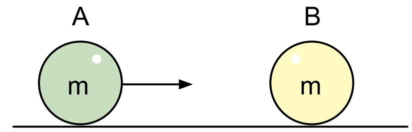
- **t**
- $\sqrt{t}$
- $t\sqrt{t}$
- t^2

13

A particle moves in a straight line where its velocity (*V*) is given as a function in position (*X*) by the relation $v^2 = \ln x$ where $x > 1$, if (a) is the acceleration of the motion, then................

- $2a\,x = 1$
- $a\ x^2 = 1$
- $a\,x = 2$
- $a\ x^2 = 2$

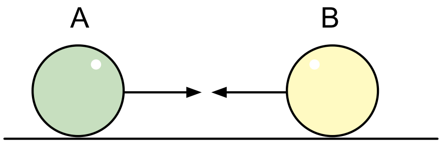
14

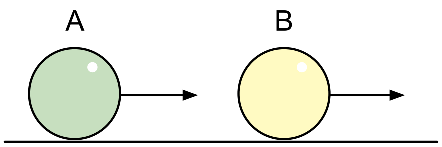
A , B are two smooth balls and the mass of each is m kg, the ball A 

is moving in a straight line on a smooth horizontal plane with velocity 8 m/sec, if the ball A collided with the rested ball B with an elastic collision, then the velocity of the ball A after collision directly =..............

- Zero
- 8 m/sec in the opposite direction
- 4 m/sec in the opposite direction
- 4 m/sec in the same direction

15





Two smooth balls A , B have the same mass are moving in a straight line on a smooth

horizontal plane with velocities V_1 , V_2 **(m/sec) respectively collided and moved as one body with velocity (v m/sec).**

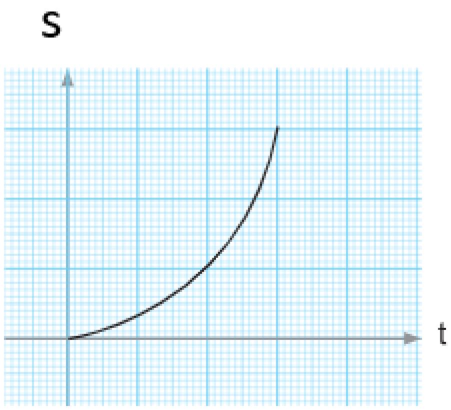
v = 2 m/sec when they ware moving in opposite directions

v =10 m/sec when they ware moving in the same directions

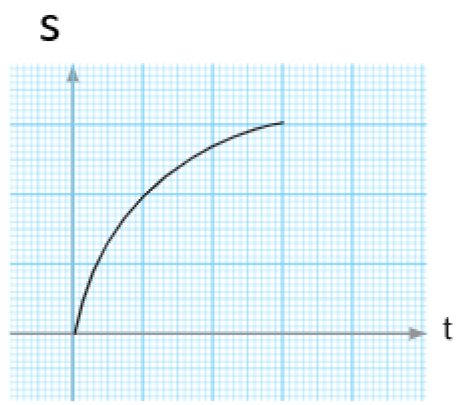
then $v_1 : v_2$ **=..............**

- **3 : 2**
- **5 : 1**
- **2 : 3**
- **1 : 5**

16



particle (1)



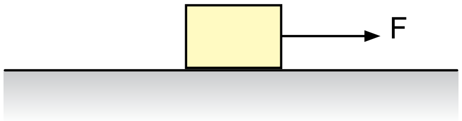
particle (2)

The figure represents the (displacement - time) graph of two particles moving in a straight line, which of the following statement is not correct?

- **particle (2) the algebraic measure of its velocity is negative**
- **particle (1) the algebraic measure of its velocity is positive**
- **particle (2) moves with retarted motion**
- **particle (1) moves with accelerated motion**

17

A body of mass m is placed on a rough horizontal plane and the coefficient



of kinetic friction between the body and the plane is 0.2, a horizontal force acting on it

for 10 seconds and moved it in its direction, then the force was ceased,

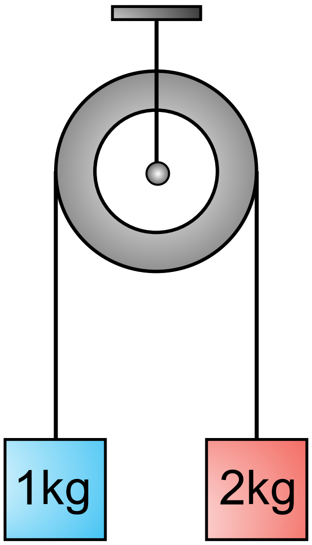
if the body stopped after covering a distance 50 m on the plane after ceasing the force,

then the ratio between the magnitude of the friction force generated during the motion

and the magnitude of the force acting on the body=..........

- **7 : 12**
- **5 : 7**
- **5 : 12**
- **12 : 35**

18



In the figure shown:

Two bodies of masses 2kg and 1kg are connected by a light string passing over a smooth pulley,

if the system moved from rest and the greater mass stopped after 1 sec,

then the string will be tensioned again after time........second.

- $\frac{2}{3}$
- $\frac{1}{3}$
- $\frac{1}{2}$
- **1**

19

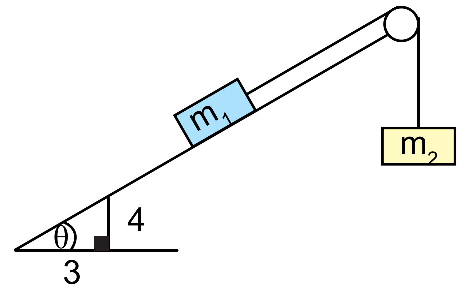
A particle moves in a straight line where its position (x) meter is given by the relation : $x^2 = t^2 + 1$, **where t(sec)**

then the acceleration of the motion (a) m/sec^2 **is given by the relation ....**

- $a = \frac{1}{x^3}$
- $a = \frac{-t}{x^3}$
- $a = \frac{-t^2}{x^3}$
- $a = \frac{1}{x} - \frac{1}{x^2}$

20

In the opposite figure:

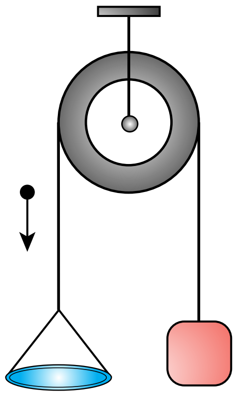


a body of mass $m_1 = 10$ kg is placed on a rough inclined plane,

and the coefficient of kinetic friction between the body and the plane is $\frac{1}{3}$ is tided by an inelastic string passing over a smooth pulley fixed at the top of the plane a body of mass $m_2 = 4$kg, is suspended vertically from the other end of the string, the system is moving where m_1 is sliding down the plane with acceleration a (m/sec^2), if a mass m is added to m_2 the system is moving in the opposite direction with acceleration a (m/sec^2) then..................

- $9 < m < 10$
- **m = 6**
- $4 < m < 6$
- $6 < m < 9$

21

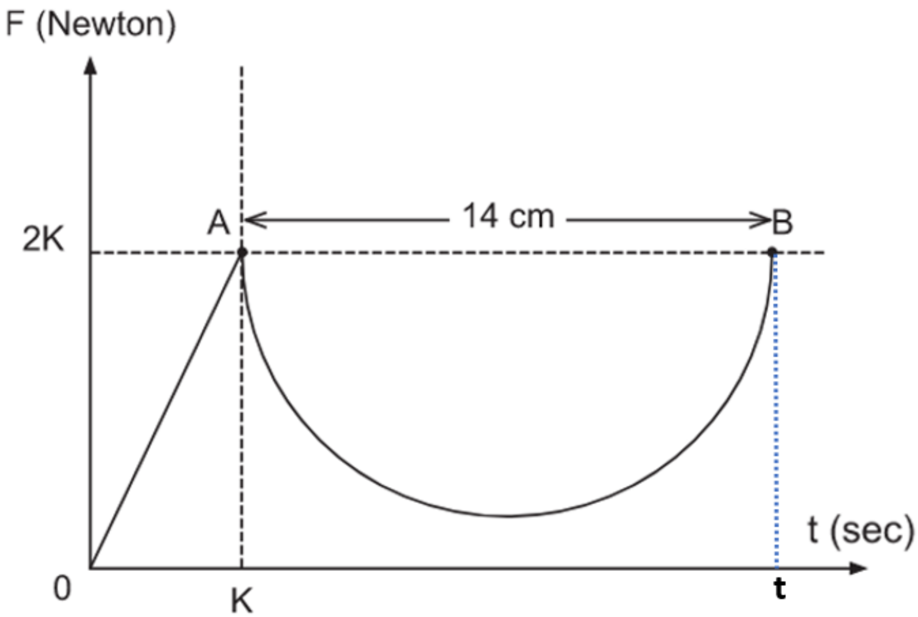


In the figure shown:

A body and a pan each of mass (m) kg are connected by a light string passing over a smooth pulley, the system is at rest, if a body of mass (m) kg fell on the pan hitting it with velocity v_o, then the system moved with velocity v , where v =............

- $\frac{1}{3} V_o$
- $\frac{1}{4} V_o$
- $\frac{1}{2} V_o$
- V_o

22



The figure shown represents, the (force - time) graph, the arc $\overset{\frown}{AB}$ represents a semi circle of diameter 14 cm, if the impulse during t seconds from the beginning is 51 Newton. sec.(consider $\pi = \frac{22}{7}$),

then $k =$ ....

- **4**
- **28**
- **18**
- **32**

23

A teacher discussed with his students the following problem, a body of mass $\frac{1}{2}$ kg moves in a straight line under the action of a force in the direction of its motion, if the velocity of the body v= 5 $X\sqrt{X}$ where v(m/sec) and X is the position of the body after t(sec) and asked them to calculate the work done by the force from X = 0 to X = 2,

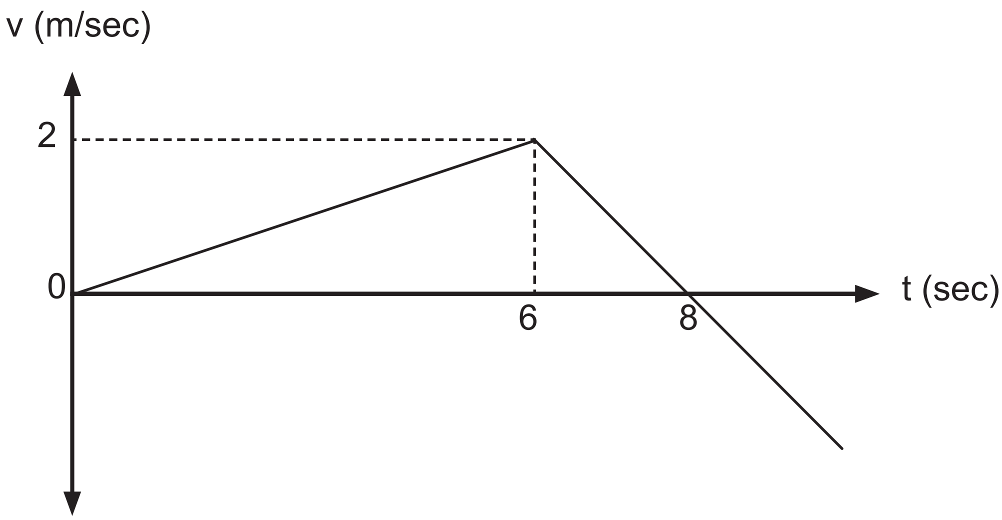
Omer's solution is $w = m\int_{v(0)}^{v(2)} v\,dv$ **and**

Khaled's solution is finding $F = \frac{d(mv)}{dt}$ **,then** $w = \int_0^2 F\,dX$**,**

then.............

- **both of them are correct**
- **Khaled only is correct**
- **Omer only is correct**
- **both of them are wrong**

24



The figure represents the (velocity - time) graph for a body moves in a straight line starting from the original point (0),

then the body came back to the point (0) after time =..........sec

- **12**
- **4**
- **8**
- **16**

25

A particle moves in a straight line under the action of a force of magnitude $F(x)=6x^2$ in a direction inclined to the direction of motion by an angle of measure 60° where *x* is the position of the particle (meter), F (Newton)

then the change in the kinetic energy of the particle when it moves from *x* = 2 to *x* = 3 is.........joule

- **19**
- **15**
- **5**
- **57**