AS-2007 Q1

1. Two trucks tow a third one by means of inextensible ropes and a pulley attached to them (fig. 1). The accelerations of the two trucks are a_1 and a_2. What is the acceleration of the third truck that is being towed?

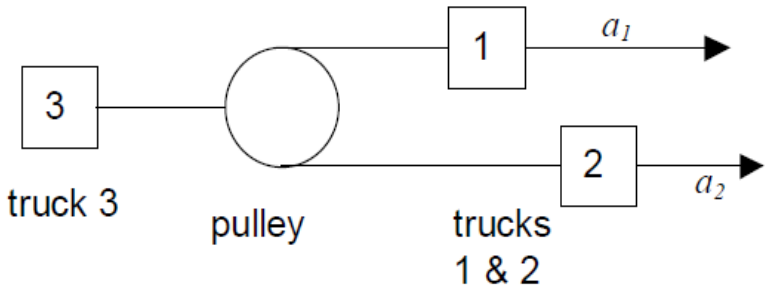


fig. 1

A. (a_1+a_2) B. (a_1-a_2) C. $\frac{(a_1+a_2)}{2}$ D. $\frac{(a_1-a_2)}{2}$

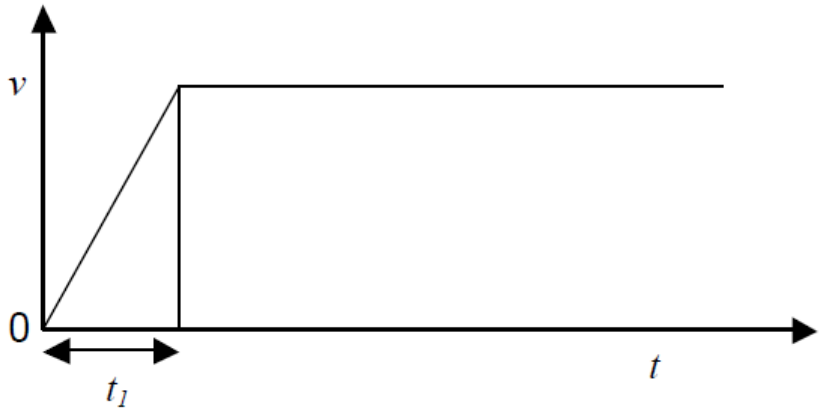
AS-2008 Q7

7. The table shows how the resistive forces on a moving object vary with the object's speed. To what power of v is F proportional?

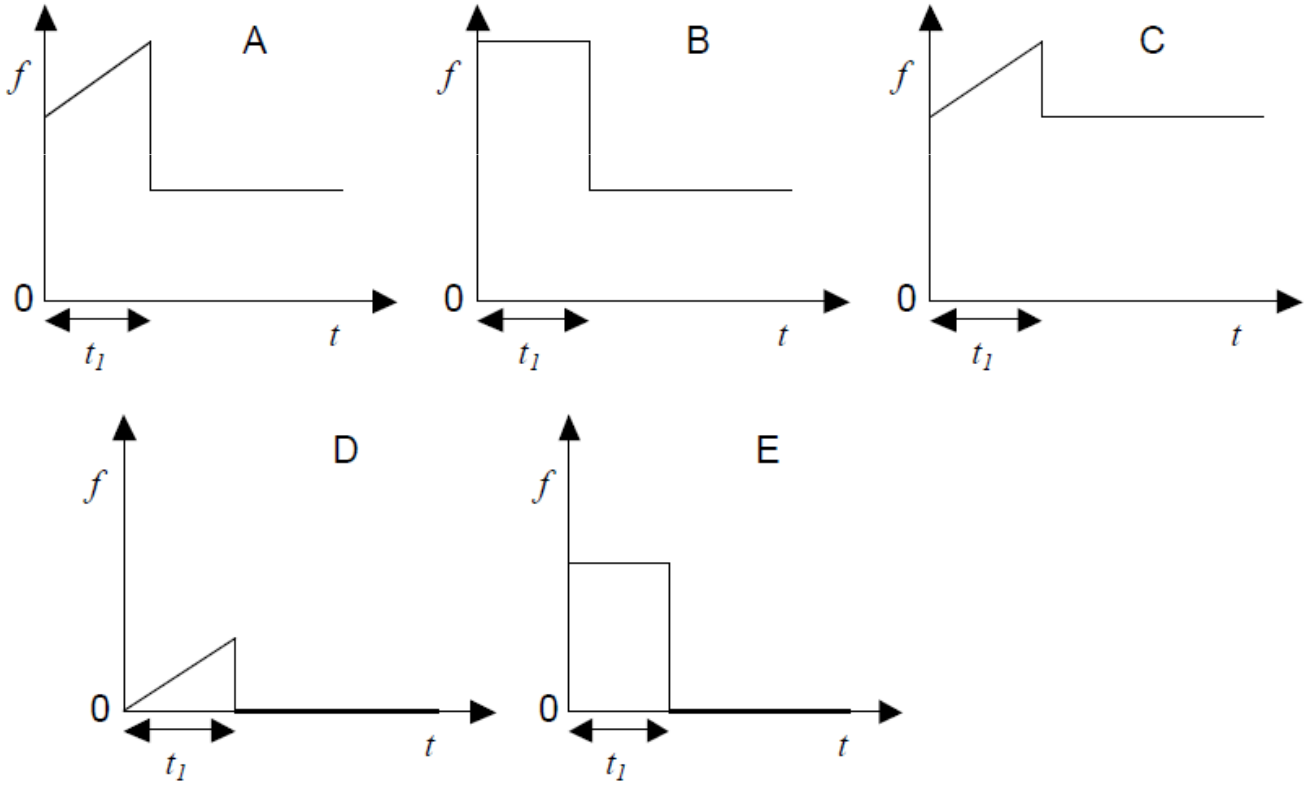
v/ms^{-1}	F/N
10	37
15	83
27	270
35	450

A. $v^{1/2}$ B. v C. v^2 D. v^3

AS-2008 Q3



The speed v of a vehicle traveling along a straight level road is shown in the above graph. It starts from rest at time $t = 0$, accelerates uniformly until $t = t_1$ and then continues at constant speed. At all times the vehicle experiences a retarding force due to friction, which is proportional to its speed. The force f, which must be applied by the engine of the vehicle, is given by



A. B. C. D.

AS-2009 Q1

1. A child is standing on a set of bathroom scales in a lift (an elevator) measuring his mass. The mass which he reads on the scales is M whilst the lift is stationary. When the lift descends at a constant speed, which of the following statement is not correct?

A. His mass remains the same

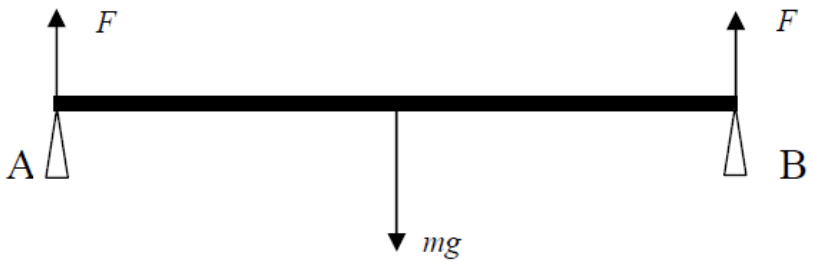
B. His weight remains the same

C. The reading on the scales depends on the speed of the lift

D. The reading on the scales remains the same

AS-2010 Q1

1. A uniform beam of mass m is rests symmetrically on two supports A and B. The forces acting on the beam are shown.
If support B is slid towards the left, how does the force provided by support A change?



A. It is always equal to the force provided by B

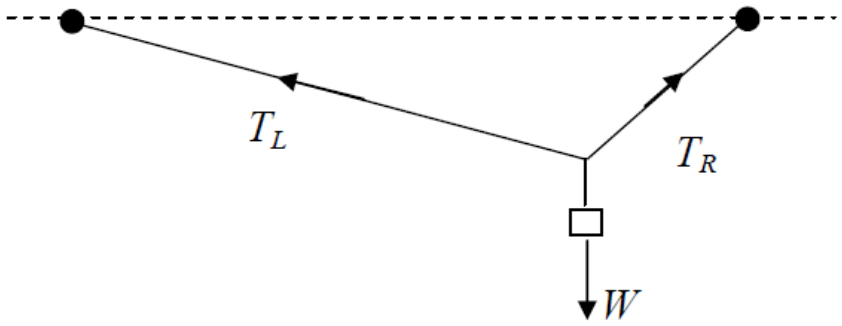
B. It remains as F

C. It becomes greater than F

D. It becomes less than F

AS-2010 Q5 & Q6

5. A weight W is hung from a wire stretched between two fixed supports as shown. The tension in the wire to the left of the weight is T_L and that to the right of the weight is T_R. Which of the following is correct?



A. $T_L + T_R = W$ **B.** $T_L = T_R$ **C.** $T_L > T_R$ **D.** $T_R > T_L$

6. A passenger, sitting on a train and facing the engine at the front of the train, has a bowl of thin soup on the table in front of him. The train decelerates as it enters a station. Which sketch best represents the level of the soup in the bowl?

A. **B.** **C.** **D.**

AS-2011 Q1

1. A toy boat floats in a tank of water which is rather carefully balanced on a block of wood. If the boat slowly drifts to the right across the tank in the diagram below, what would likely happen to the tank of water in which it is floating?

A. The tank will tip so that the right hand side drops down

B. The tank will remain balanced

C. The tank will tip so that the left hand side drops down

D. It depends on how slowly the boat drifts across

AS-2012 Q3

A mass m is lifted at a constant slow speed. The force of gravity when it is held in your hand is mg. When it is being lifted, the force required is

A. Slightly less than mg

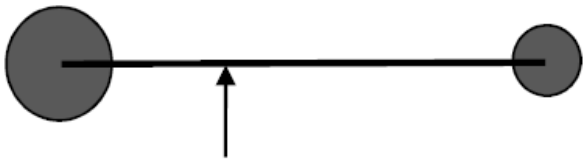
B. Equal to mg

C. Slightly more than mg

D. Dependent upon the how fast it is raised

AS-2012 Q7

Two spheres of the same density but different masses are supported with their centres at the ends of a uniform bar of length $\ell = 10$ units. The larger sphere has three times the mass of the smaller sphere, and the bar itself has a mass equal to the mass of the smaller sphere.
How many units from the left hand end should the pivot be placed to balance the bar?



A. 1 unit B. 2 units C. 3 units D. 4 units

AS-2012 Q11

The weights shown in figure 2 below are balanced on strings and pulleys of negligible mass and friction. The masses m_A and m_B are not the same.

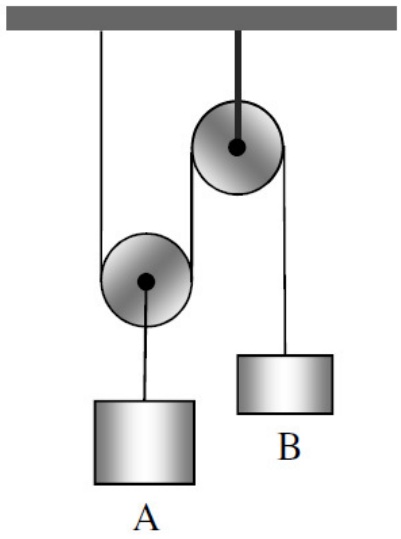


Figure 2.

a) If mass **A** is pulled down by a distance h, how far does mass **B** move?

_____

_____ [1]

b) In terms of masses m_A and m_B, what would be the changes of gravitational potential energy (gpe) of each mass, and what would be the change in gpe of the whole system?

_____

_____

_____ [2]

c) When **A** is pulled down and then released, the masses remain stationary in their new positions. How has the gravitational potential energy of the system changed from the start?

_____

_____ [1]

d) What is the ratio of the masses $\frac{m_A}{m_B}$? Give a reason for your answer.

_____

_____ [2]

/6