

Person X pushes twice as hard against a stationary brick wall as person Y. Which one of the following statements is correct?

- A. Both do positive work, but person X does four times the work of person Y.
- B. Bth do positive work, but person X does twice the work of person Y.
- C. Both do the same amount of positive work.
- D. Each one of them does zero work 
- E. Both do positive work, but person X does one-half the work of person Y.

What is the average power output (in W) of a 60.0-kg athlete when, in 8.00 s, he runs up a flight of stairs that is 10.0-m high at constant speed?

- A. 75.0
- B. 735
- C. 4800
- D. 48
- E. 600

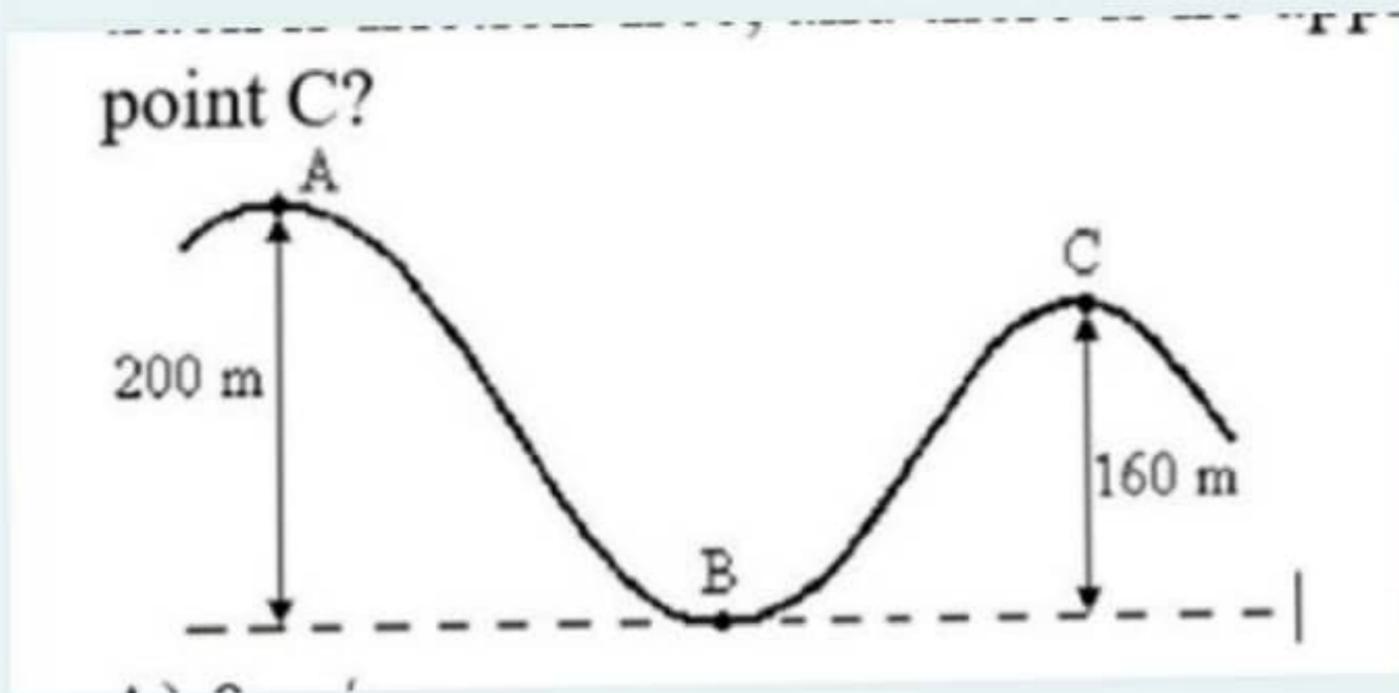


A 60-kg skier starts from rest from the top of a 50-m high slope. If the work done by friction is -6.0 kJ, what is the speed (in m/s) of the skier on reaching the bottom of the slope?

- A. 17
- B. 24
- C. 28
- D. 31
- E. 57



A bead is moving with a speed of 20 m/s at position A on the track shown in the figure. This track is friction-free. What is the speed (in m/s) of the bead at point C?



- A. 0
- B. 34
- C. 69
- D. 20
- E. We cannot solve this problem without knowing the mass of the bead.

A 4.0 kg object is moving with speed 2.0 m/s. A 1.0 kg object is moving with speed 4.0 m/s. Both objects encounter the same constant braking force, and are brought to rest. Which object travels the greater distance before stopping?

- A. the 4.0 kg object
- B. the 1.0 kg object
- C. both objects travel the same distance ✓
- D. answer cannot be determined from the information given
- E. The 4 kg object travels twice the distance covered by the 1 kg object

A truck has four times the mass of a car and is moving with twice the speed of the car. If K_t and K_c refer to the kinetic energies of truck and car respectively, it is correct to say that

- A. $K_t = 16K_c$
- B. $K_t = 4K_c$
- C. $K_t = 2K_c$
- D. $K_t = K_c$
- E. $K_t = K_c$



A 35-N bucket of water is lifted vertically 3.0 m and then returned to its original position. How much work (in J) did gravity do on the bucket during this process?

- A. 180
- B. 90
- C. 0
- D. 900
- E. 45



When a car of mass 1167 kg accelerates from 10.0 m/s to some final speed, 4.00×10^5 J of work are done. Find this final speed (in m/s).

A. 28.0

B. 22.4

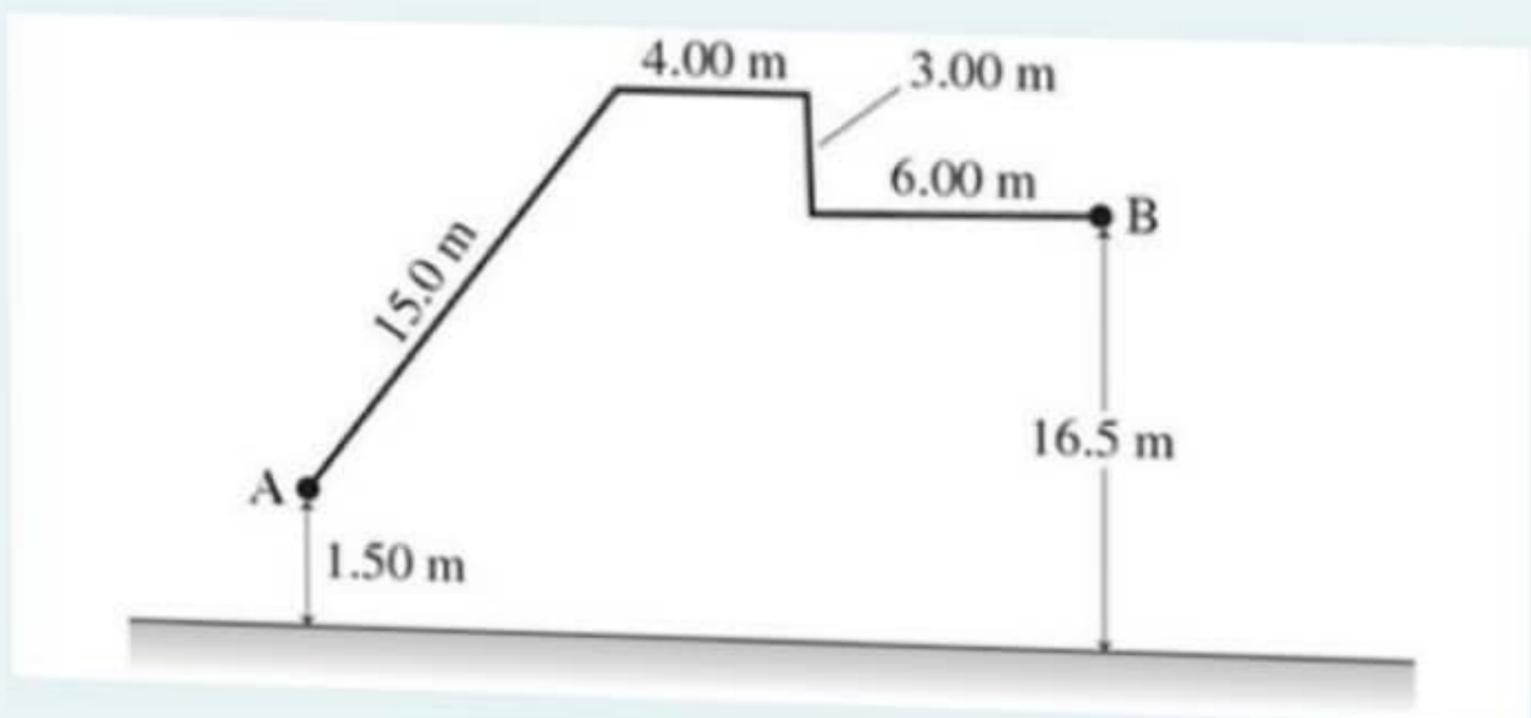
C. 25.2

D. 30.8

E. 16.7



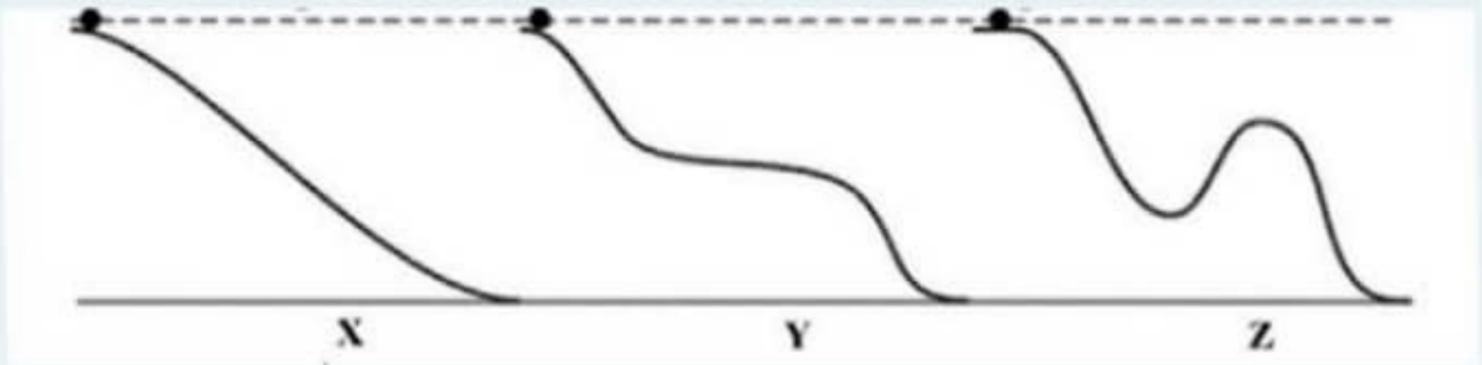
A person carries a 2.00-N object through the path shown in the figure, starting at point A and ending at point B. The total time from A to B is 6.75 min. How much work did gravity do on the object between A and B?



- a. 30.0
- b. -30
- c. -56
- d. -36
- e. 0



A stone can slide down one of four different frictionless ramps, as shown in the figure. For which ramp will the speed of the ball be the greatest at the bottom?



- A. Ramp X
- B. Ramp Y
- C. Ramp Z
- D. The speed of the ball will be the same for all ramps ✓
- E. More information is needed to answer the question

The kinetic friction force that a horizontal surface exerts on a 60.0-kg object is 50.0 N. If the initial speed of the object is 25.0 m/s, what distance (in m) will it slide before coming to a stop?

- A. 15.0
- B. 30.0
- C. 375
- D. 750
- E. 855



A stone initially moving at 8.0 m/s on a level surface comes to rest due to friction after it travels 11 m . What is the coefficient of kinetic friction between the stone and the surface?

- A. 0.13
- B. 0.50
- C. 0.30
- D. 0.43
- E. 0.80



A student starts from the origin at $t=0$ s. He moved along the positive x -direction for 6.0 m. Then he moved along the negative x -direction a distance of 3.0 m. If the total time of his motion is 6.0 s, then his average speed (in m/s) is:

- a. 2.0
- b. 0
- c. 3.0
- d. 1.0
- e. 1.5



The correct answer is: 1.5

The velocities (in m/s) of cars A and B are given at equal time intervals.

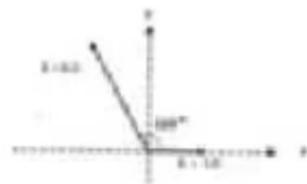
Car A:	20	20	20	20
Car B:	1	3	5	7

Which of the following statements is correct?

- a. Neither car accelerates
- b. Car A has variable velocity
- c. Car A does not accelerate and car B accelerates. ✓
- d. Car B is moving along the negative x-direction
- e. Car A has larger acceleration than car B

The correct answer is: Car A does not accelerate and car B accelerates.

Vectors $A = 3.0$ m and $B = 8.0$ m are represented as shown in the figure. What is the magnitude (in m) of the resultant ?



- a. 7.0
- b. 3.9
- c. 11.0
- d. 4.2
- e. 8.4



The correct answer is: 7.0

Which of the following can be used as a conversion factor to write m/s as mi/h? (1 mi = 1609 m)

- a. $(1609/3600)$ mi/h
- b. $(3600/1609)$ mi/h
- c. $(1609/3600)$ h/mi
- d. $(3600/1609)$ h/mi
- e. 3600 s/h



The correct answer is:
 $(3600/1609)$ mi/h

Which of the following statements is correct?

- a. If an object moves, its average velocity can NEVER be zero.
- b. A car moving at constant velocity has non zero acceleration.
- c. Average velocity depends on distance
- d. If an object moves its average velocity can be zero, but its average speed must be greater than zero. ✓
- e. Average speed depends on displacement

The position of a runner is $x = 2.0$ m at $t = 1.0$ s . At $t = 3.0$ s the new position of the runner is $x = 5.0$ m. The average velocity (in m/s) of the runner over the time interval from 1.0 to 3.0 s is:

- a. 1.5
- b. 3.0
- c. 0
- d. 1.0
- e. 6.0



The density of gold is 19000 kg/m³. The density of gold in gram/cm³ is:

- a. 1
- b. 19
- c. 0.19
- d. 1900
- e. 190



The correct answer is: 19

A car moves from point A to point B at a speed of 25 km/h. It then moved from point B back to point A at a speed of 20 km/h. The average speed (in km/h) of the car is:

- a. 22.5
- b. 22.2
- c. 23.7
- d. 11.1
- e. 21.9



The correct answer is: 22.2

The position of a car is given by the equation $x = A + B t^2$. The dimensions of the constants A and B, respectively, are:

- a. T^2/L
- b. L^2 and $L T^2$
- c. L^2 and L/T^4
- d. L and L/T^2
- e. T^2



The correct answer is: L and L/T^2

A car is moving at 35 km/h.
The speed of the car in m/s is:

- a. 35
- b. 9.7
- c. 126
- d. 75
- e. 22

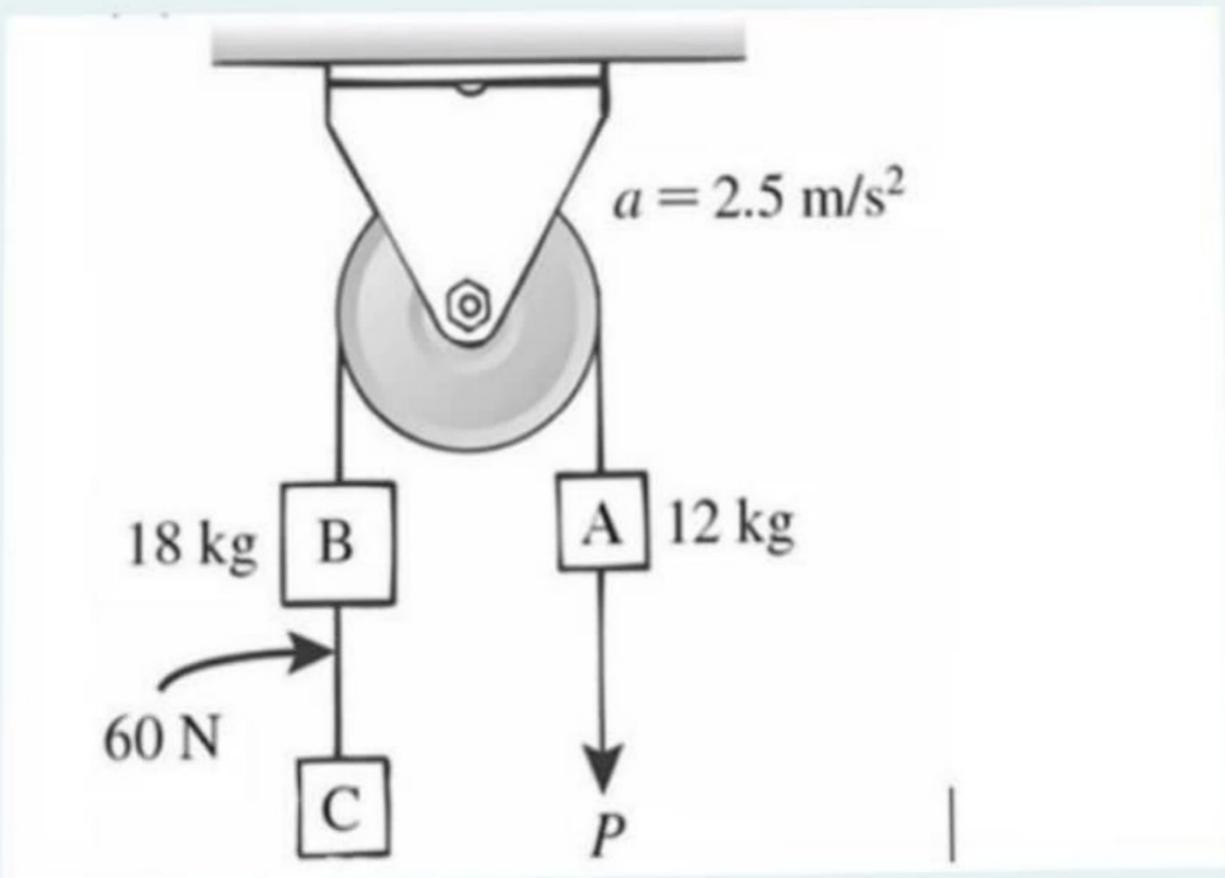


The correct answer is: 9.7

If a car is moving to the left with constant velocity, one can conclude that

- A. there must be no forces applied to the car.
- B. there is exactly one force applied to the car.
- C. The net force applied to the car must be to the right
- D. the net force applied to the car is directed to the left.
- E. the net force applied to the car is zero. ✓

Three blocks, light connecting ropes, and a light frictionless pulley comprise a system, as shown in the figure. An external force of magnitude P is applied downward on block A, causing block A to accelerate downward at a constant 2.5 m/s^2 . The tension in the rope connecting block B and block C is equal to 60 N . The mass (in kg) of block C is:



- A. 18.0
- B. 3.5
- C. 9.8
- D. 4.9
- E. 6.0

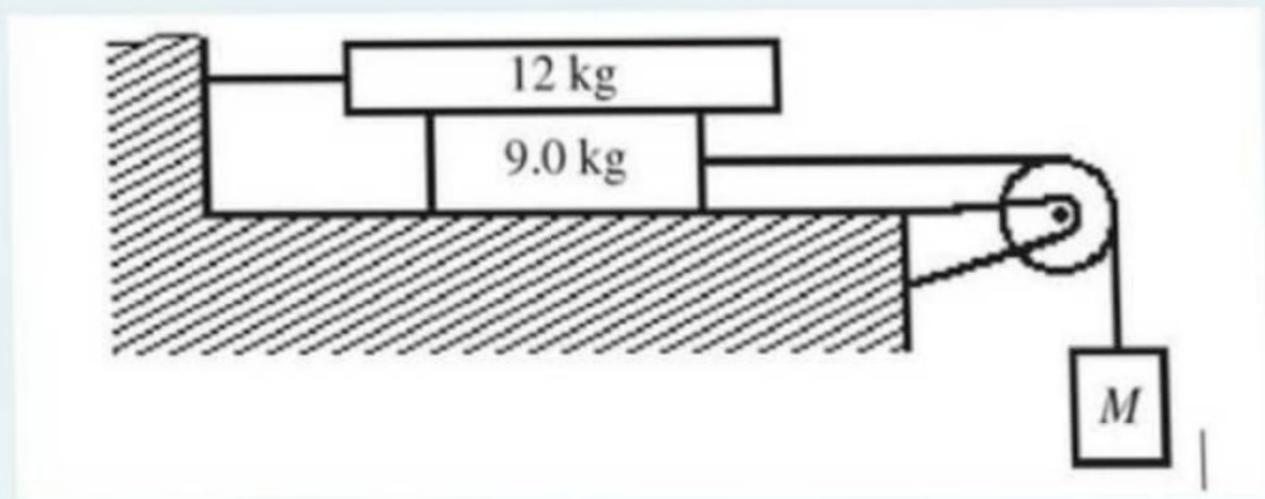


A trolley is carrying a 20.0-kg box along a level road. The coefficient of static friction between the box and the floor of the trolley is 0.400, and the coefficient of kinetic friction is 0.300. What is the maximum acceleration (in m/s^2) that the trolley can have if the box is to move with the trolley without sliding?

- A. 7.40
- B. 196
- C. 3.92
- D. 8.00
- E. 78.5



In the figure the 9.0-kg block is on a smooth horizontal table. The surfaces of the 12-kg block are rough, with $\mu_k = 0.30$ between the 12-kg and 9.0-kg blocks. The mass $M=5.0$ and accelerates downwards. The acceleration of mass M (in m/s^2).



- A. 5.7
- B. 6.2
- C. 1.9
- D. 3.1
- E. 0.98



An object can remain at rest

- A. ONLY when there are ✗
no forces at all acting
on it.
- B. when the net force acting
on it is zero
- C. when the net force acting
on it is a nonzero
constant.
- D. when there is only one
force acting on it.
- E. Only when no frictional
forces acting on it

A box of mass of $m_1 = 10$ kg collides with a box of mass $m_2 = 2$ kg. Which of the following statements is correct?

- A. m_1 acts with a force on m_2 but m_2 does not act with a force on m_1 because it is small
- B. No force is exchanged between m_1 and m_2
- C. The force of m_1 on m_2 is five times larger than the force of m_2 on m_1
- D. The force of m_2 on m_1  is equal to the force of m_1 on m_2
- E. The force of m_2 on m_1 is larger than the force of m_1 on m_2

A person is using a rope to lower a 5.0-N bucket into a well with a constant speed of 2.0 m/s. What is the magnitude of the force exerted by the rope on the bucket?

A. 10

B. 5

C. 0

D. 2

E. 49



A 60-kg person is in an elevator that is moving down and accelerating at 2 m/s^2 . His apparent weight (in N) is: (take $g=9.8 \text{ m/s}^2$)

- A. 468
- B. 590
- C. 588
- D. zero
- E. 660

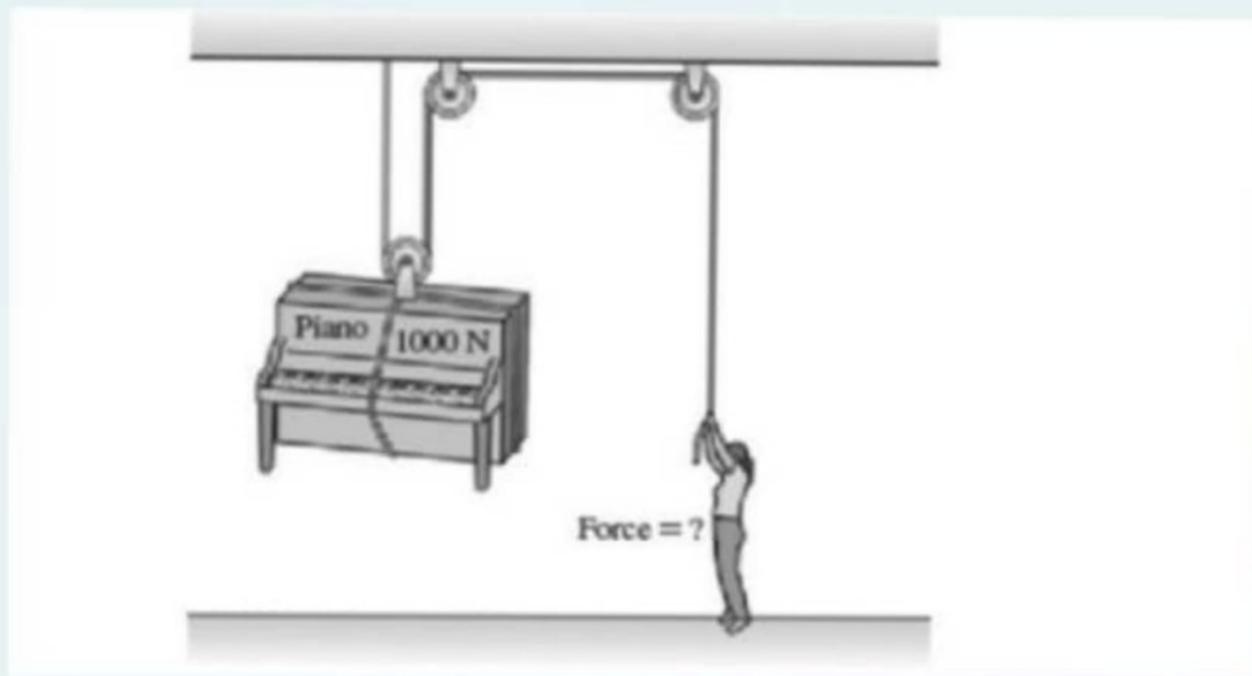


A 1200-kg car is pulling a 500-kg trailer along level ground. Friction of the road on the trailer is negligible. The car accelerates with an acceleration of 1.3 m/s^2 . What is the force exerted by the car on the trailer?

- A. 550
- B. 600
- C. 700
- D. 650
- E. 300



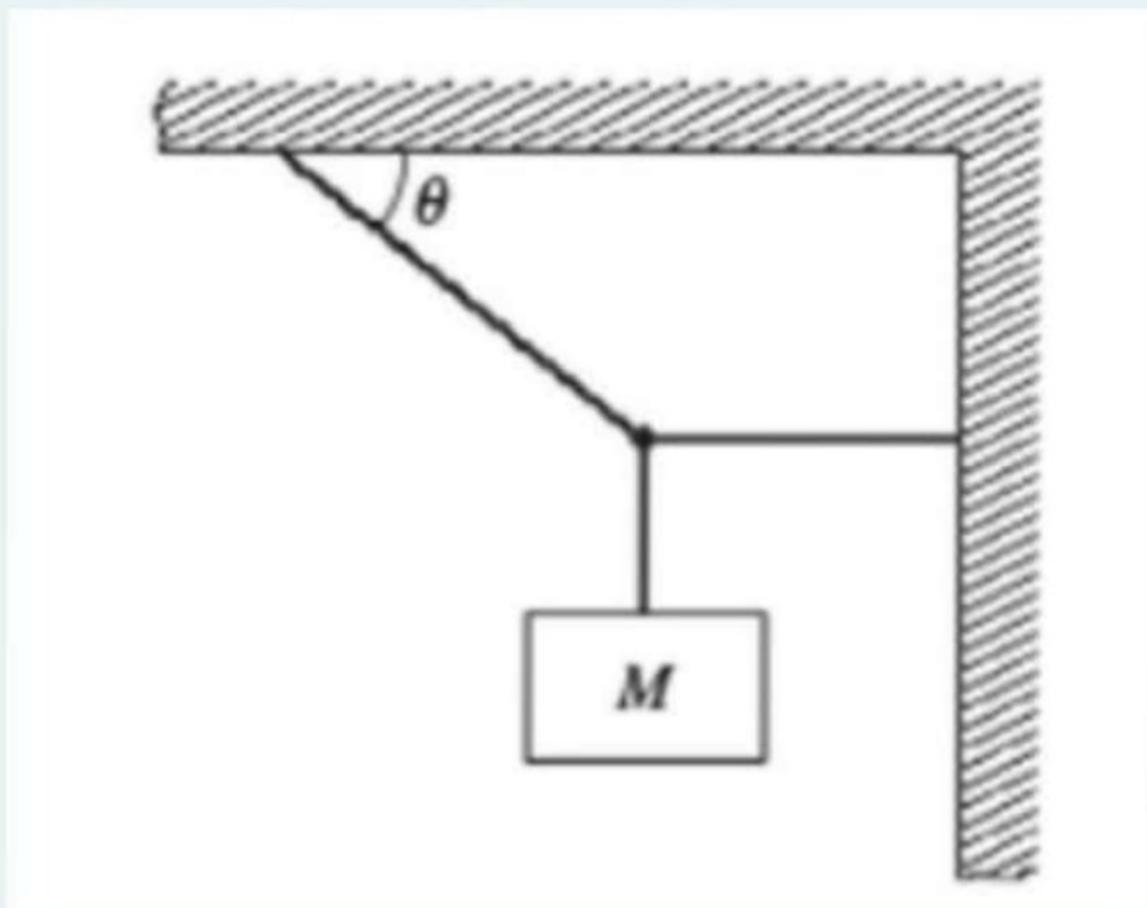
A man raises a 1000-N piano at a constant speed using a very light rope in a frictionless pulley system, as shown in the figure. With what force is the man pulling down on the rope?



- A. 250
- B. 1000
- C. 500
- D. 2000
- E. 1500



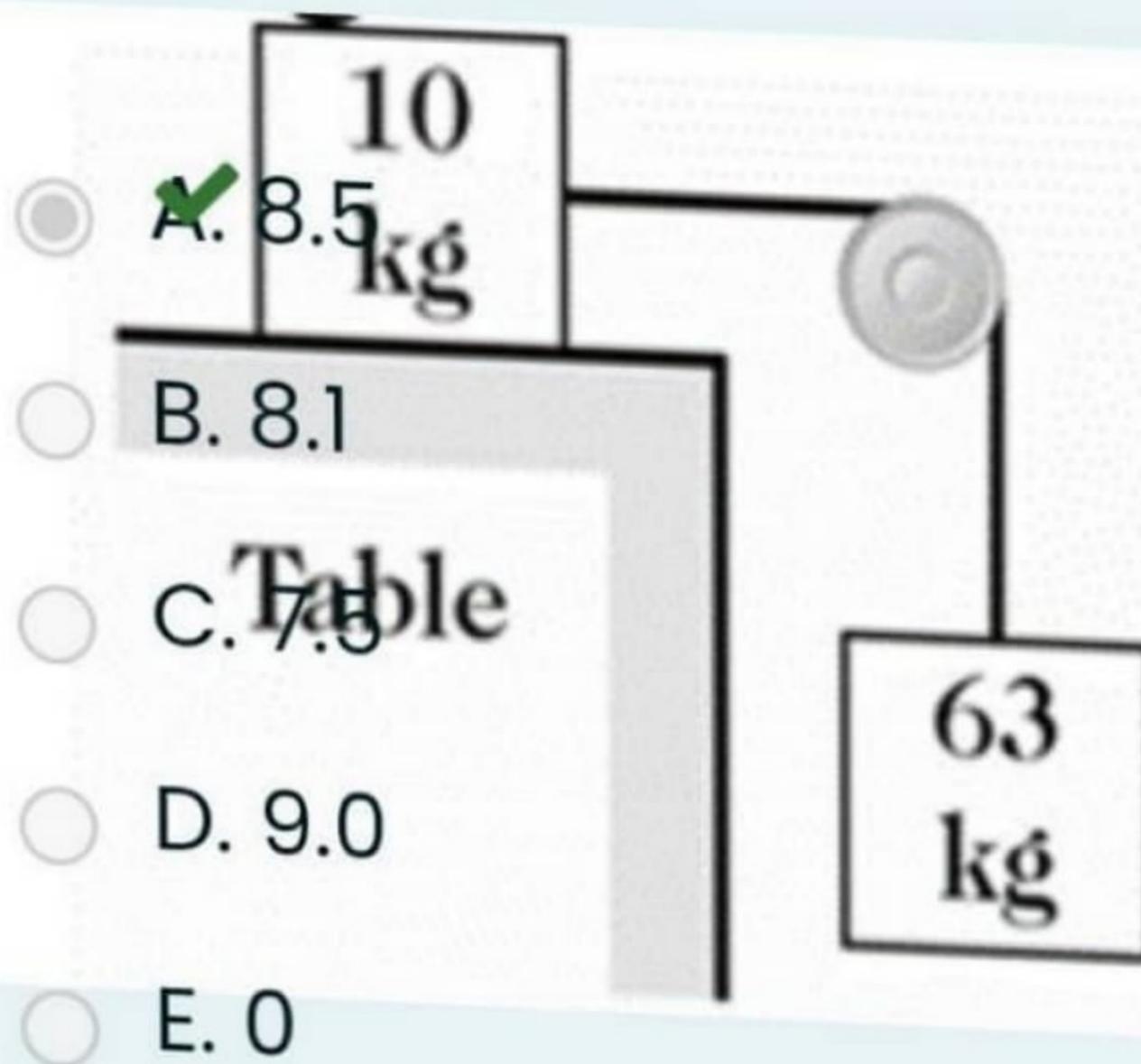
The figure shows a block of mass M hanging at rest. The light wire fastened to the wall is horizontal and has a tension of 38 N. The wire fastened to the ceiling is also very light, has a tension of 59 N and makes an angle θ with the ceiling. Find the angle θ (in degrees).



- A. 40
- B. 65
- C. 45
- D. 33
- E. 50



In the figure the surface of the table is smooth and the system is released from rest. What is the magnitude of the acceleration of the 10-kg block (in m/s^2) when the system is released from rest?



University of Jordan / Physics Department
 Physics for medicine and dentistry (0342105)
 Revision Question for/Prof. Mahmoud Jaghoub

Q1) what is the pressure (in atm) at the base of a dam if the water is 200 m deep?

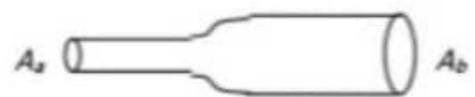
- A) 20.3 B) 24.7 C) 29.4 D) 19.3 E) 0

Q2) A supertanker filled with oil has a total mass of 6×10^8 kg. If the dimensions of the ship are those of a box 300 m long, 80 m wide and 40 m high, determine how far (in m) the bottom of the ship is below sea water. (Assume density of sea water = 1020 kg/m^3)

- A) 10 B) 15 C) 18 D) 19 E) 25

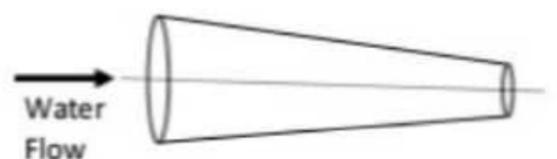
Q3) Water flows (streamline, nonviscous) from point *a* to point *b* in the horizontal section shown in the figure. Which of the following statements is correct regarding the velocity *v*, pressure *P*, and flow rate at the two ends of the section?

- A) $v_a < v_b$ B) $P_a > P_b$ C) $P_a < P_b$
 D) $P_a = P_b$ E) $v_a = v_b$



Q4) A 4.0 cm radius horizontal pipe gradually narrows down to 2.0 cm. When water flows in this pipe the pressure in these two sections is 32.0 kPa and 24.0 kPa, respectively. What is the speed of the water through the smaller section?

- A) 4.1 B) 1.0 C) 3.5 D) 17.0 E) 5.4



Q5) A 2 μCi radioactive source emits neutrons each with 2.4 MeV energy. The radiated energy (in μJ per hour) is: ($\mu\text{Ci} = 10^{-6} \text{ Ci}$ and $1 \text{ Ci} = 3.70 \times 10^{10} \text{ decays/sec}$, $1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$)

- A) 23 B) 42 C) 102 D) 150 E) 250

Q6) What is the activity (in decay/sec) of 8.8 μg mass of ^{124}Cs , which has a half-life of 30.8 s ?

- A) 6.5×10^{13} B) 9.6×10^{14} C) 1.2×10^{13} D) 8.8×10^{13} E) 1.9×10^{13}

Q7) A radioactive isotope decays by β^- emission with a half-life of 1.0 day. The initial number of radioactive nuclei is 8000. The number of the remaining radioactive nuclei after 3 days is:

- A) 4000 B) 1000 C) 1500 D) 2000 E) 8000

Q8) A 2 mSv (milli sievert) is equivalent to:

- A) 0.2 rem B) 0.2 rad C) 2 Gy D) 20 rem E) 20 rad

Q9) Three radioactive sources have the same activity. The decay modes, energy of each emitted particle and the corresponding RBE values are given in the following table. Arrange the three sources according to their danger to biological tissues from least to most dangerous. (Assume the **absorbed dose** from each source to be equal).

- A) 2, 3, 1
 B) 1, 2, 3
 C) 3, 2, 1
 D) 2, 1, 3
 E) 1, 3, 2

Source	Decay mode	Energy per emitted particle	RBE
1	protons	3MeV	2
2	Fast neutrons	1MeV	10
3	Alpha particles	1 MeV	20

Q10) A 70-kg laboratory technician exposed to α -particles absorbs 0.03 mJ of energy. The relative biological effectiveness (RBE) for α -particles is 20. What is his effective dose (in mrem)?

- A) 1.20 B) 1.09 C) 1.00 D) 0.92 E) 0.86