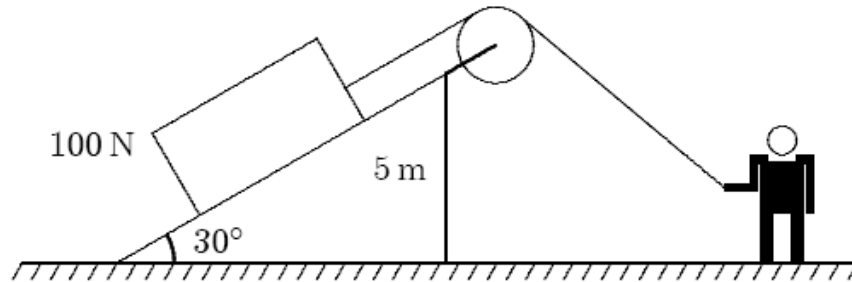


**Sample problems for Exam 3 Phys 105, Spring 2008**

1. A man pulls a 100-N crate up a frictionless 30° slope 5 m high, as shown. Assuming that the crate moves at the constant speed the work done by the man:

- A. -500 J
- B. -250J



- C. 0
- D. 250J
- E. 500 J

Ans.E

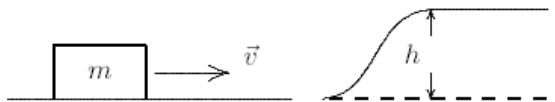
2. A 2-kg object is moving at 3 m/s. A 4-N force is applied in the direction of motion and then removed after the object has traveled an additional 5 m. The work done by this force is:

- A. 12J
- B. 15 J
- C. 18 J
- D. 20 J
- E. 38 J

ansD

3.

For a block of mass  $m$  to slide without friction up the rise of height  $h$  shown, it must have a minimum initial kinetic energy of:

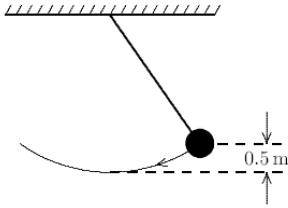


- A.  $gh$
- B.  $mgh$
- C.  $gh/2$
- D.  $mgh/2$
- E.  $2mgh$

ans: B

4.

The long pendulum shown is drawn aside until the ball has risen 0.50 m. It is then given an initial speed of 3.0 m/s. The speed of the ball at its lowest position is:

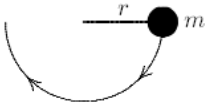


- A. zero
- B. 0.89 m/s
- C. 3.1 m/s
- D. 3.7 m/s
- E. 4.3 m/s

ans: E

5.

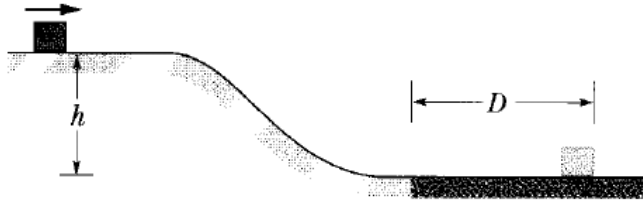
A small object of mass  $m$ , on the end of a light cord, is held horizontally at a distance  $r$  from a fixed support as shown. The object is then released. What is the tension force of the cord when the object is at the lowest point of its swing?



- A. 2.0 m/s
- B. 2.2 m/s
- C. 3.1 m/s
- D. 4.4 m/s
- E. 6.0 m/s

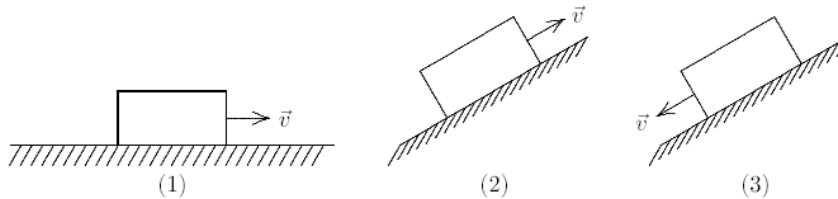
ans: C

6 In Fig. 8-25, a block slides along a track that descends through distance  $h$ . The track is frictionless except for the lower section. There the block slides to a stop in a certain distance  $D$  because of friction. (a) If we decrease  $h$ , will the block now slide to a stop in a distance that is greater than, less than, or equal to  $D$ ? (b) If, instead, we increase the mass of the block, will the stopping distance now be greater than, less than, or equal to  $D$ ?



7.

Three identical blocks move either on a horizontal surface, up a plane, or down a plane, as shown below. They start with different speeds and continue to move until brought to rest by friction. They all move the same distance. Rank the three situations according to the initial speeds, least to greatest.



- A. The same for all cases
- B. 1, 2, 3
- C. 1, then 2 and 3 tie
- D. 3, 1, 2
- E. 2, 1, 3

ans: D