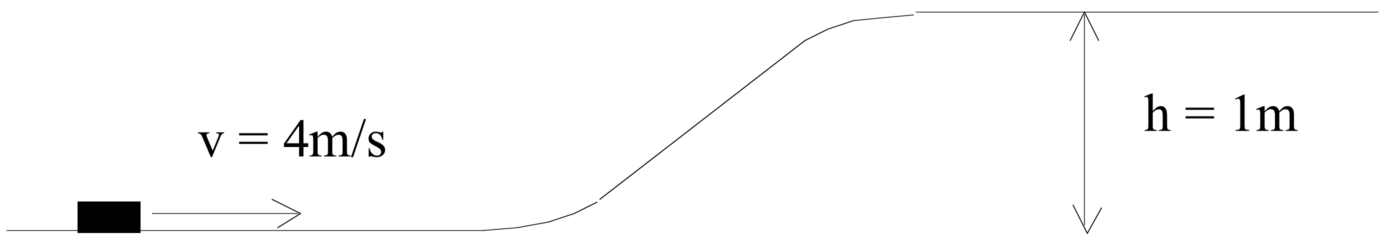
CT8-3

A hockey puck slides without friction along a frozen lake toward an ice ramp and plateau as shown. The speed of the puck is 4m/s and the height of the plateau is 1m. Will the puck make it all the way up the ramp?



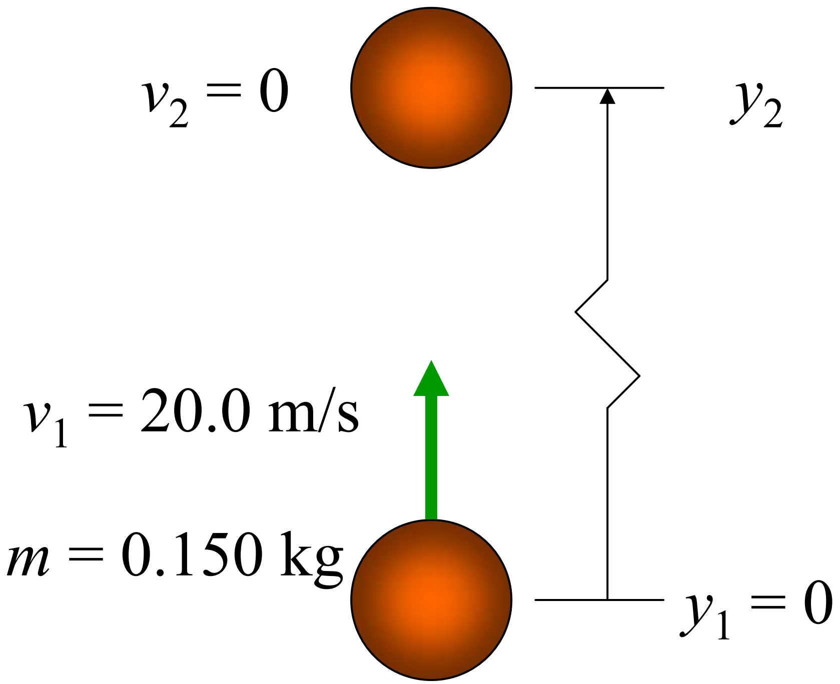
A: Yes **B:** No

C: impossible to determine without knowing the mass of the puck.

Q7.2

You toss a 0.150-kg baseball straight upward so that it leaves your hand moving at 20.0 m/s. The ball reaches a maximum height y_2.

What is the speed of the ball when it is at a height of $y_2/2$? Ignore air resistance.



A. 10.0 m/s

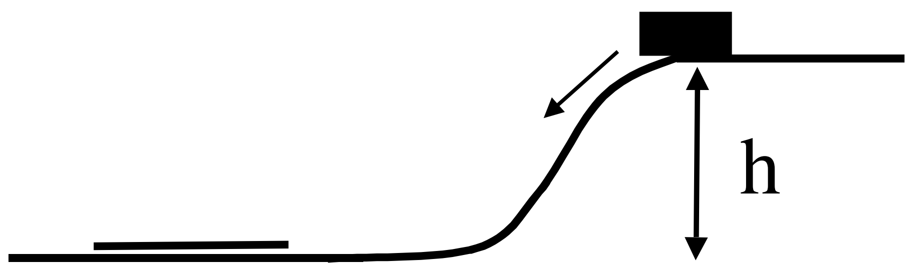
B. less than 10.0 m/s but more than zero

C. more than 10.0 m/s

D. not enough information given to decide

CT8-10

A mass slides down a frictionless ramp of height h and hits a carpet with kinetic friction coefficient $\mu_K = 0.9$
Its initial speed is zero.
How far does the mass slide along the carpet?



A: h **B**: Less than h **C:** More than h
D. Not enough information to decide.

CT8-7

A mass m is at the end of light (massless) rod of length R, the other end of which has a frictionless pivot so the rod can swing in a vertical plane.
The rod is initially horizontal and the mass is pushed down with an initial speed v_o

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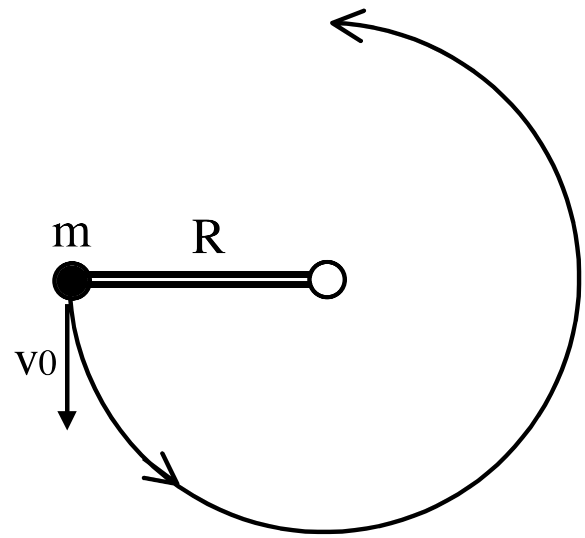


What initial kinetic energy is required for the mass to pivot 270° (to the vertical, or "12 o'clock" position?)

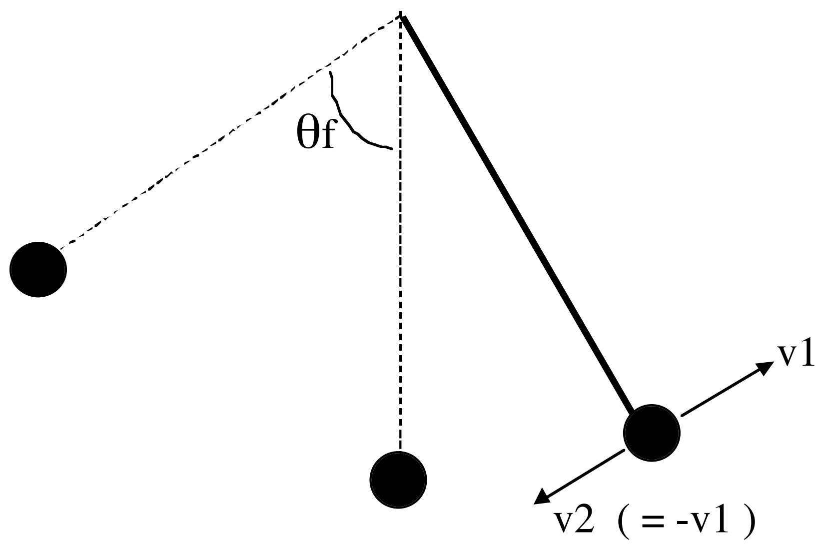
$$\frac{1}{2}mv_o^2 =$$

A: mgR **B:** mg*(2R) **C:** mg*(3R)

D: 0 **E:** None of these

CT8-6

A pendulum is launched in two different ways. During both launches, the bob has an initial speed of 3.0 m/s. On launch 1, the speed is up (along the trajectory). On launch 2, the speed is down (along the trajectory).



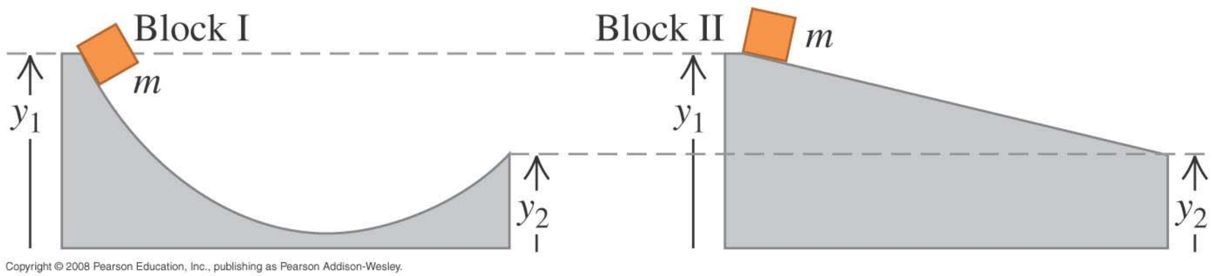
Which launch will cause the pendulum to swing the largest angle from the equilibrium position on the left side?

A: Launch 1 **B**: Launch 2

C: Both launches give the same max displacement.

Q7.4

The two ramps shown are both frictionless. The heights y_1 and y_2 are the same for each ramp. A block of mass m is released from rest at the left-hand end of each ramp. Which block arrives at the right-hand end with the greater speed?



A. the block on the curved track

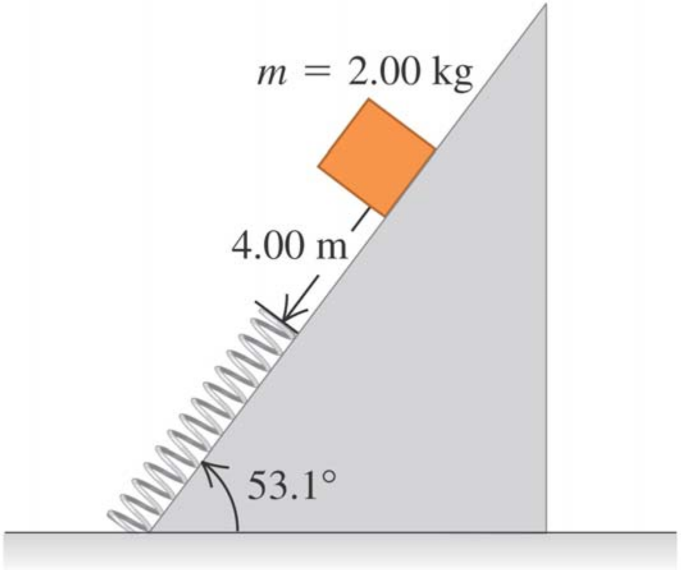
B. the block on the straight track

C. Both blocks arrive at the right-hand end with the same speed.

D. The answer depends on the shape of the curved track.

Q7.5

A block is released from rest on a frictionless incline as shown. When the moving block is in contact with the spring and compressing it, what is happening to the gravitational potential energy U_{grav} and the elastic potential energy U_{el}?



A. U_{grav} and U_{el} are both increasing.

B. U_{grav} and U_{el} are both decreasing.

C. U_{grav} is increasing, U_{el} is decreasing.

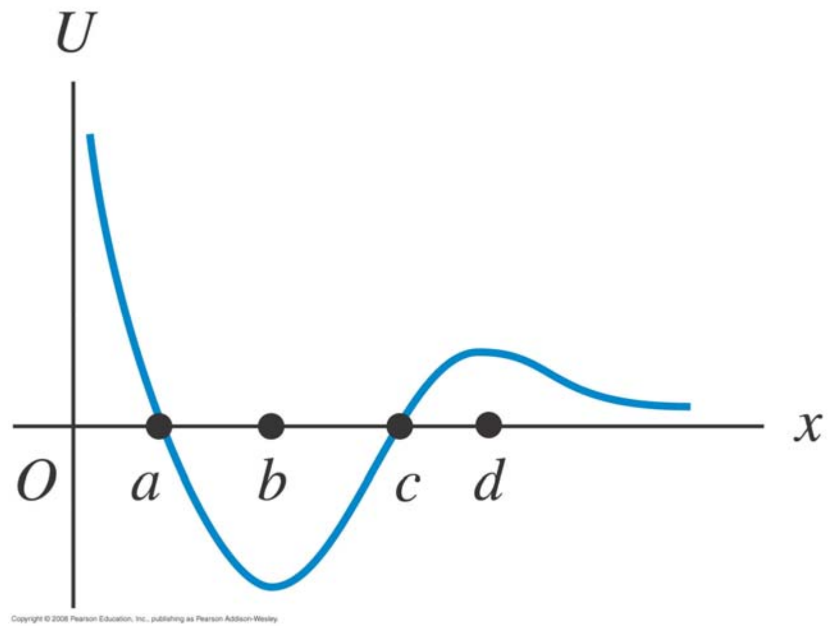
D. U_{grav} is decreasing, U_{el} is increasing.

E. The answer depends on how the block's speed is changing.

Q7.6

The graph shows the potential energy U for a particle that moves along the x-axis.

The particle is initially at $x = d$ and moves in the negative x-direction. At which of the labeled x-coordinates does the particle have the greatest *speed*?



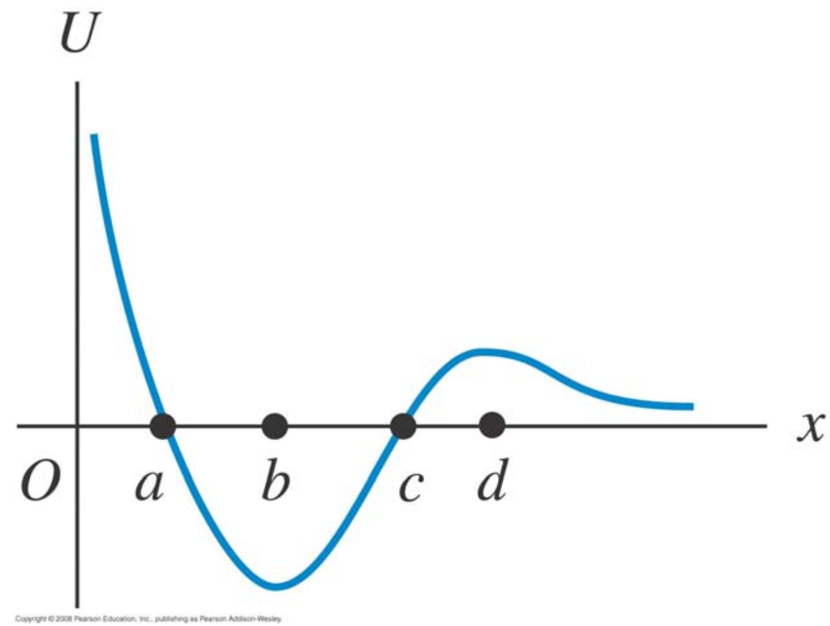
A. at $x = a$ B. at $x = b$ C. at $x = c$ D. at $x = d$

E. more than one of the above

Q7.7

The graph shows the potential energy U for a particle that moves along the x-axis.

The particle is initially at $x = d$ and moves in the negative x-direction. At which of the labeled x-coordinates is the particle *slowing down*?

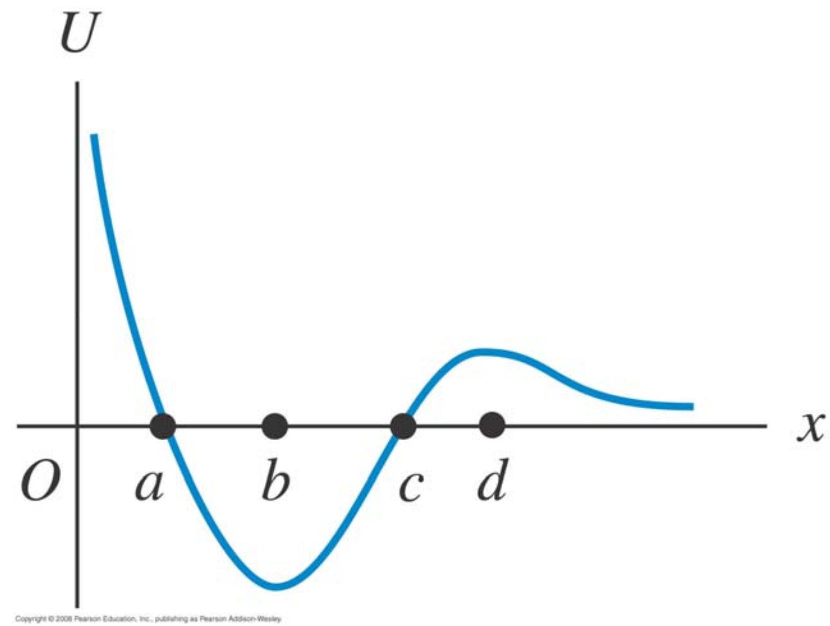


A. at $x = a$ B. at $x = b$ C. at $x = c$ D. at $x = d$

E. more than one of the above

Q7.8

The graph shows the potential energy U for a particle that moves along the x-axis. At which of the labeled x-coordinates is there *zero* force on the particle?



A. at $x = a$ and $x = c$

B. at $x = b$ only

C. at $x = d$ only

D. at $x = b$ and d

E. misleading question — there is a force at all values of x.