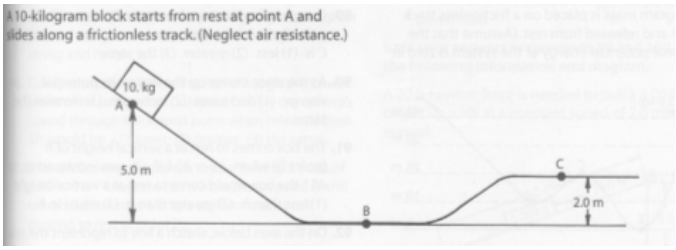
Name _____
Physics

Energy Puzzlers



1). As the block moves from A to B, the total amount of gravitational potential energy that changes into kinetic energy is how much?

2). What is the approximate speed of the block at point B?

3). What is the approximate potential energy of the block at point C?

4). Has the total amount of mechanical energy in this system changed? State YES or NO and <u>be sure to explain your answer.</u>

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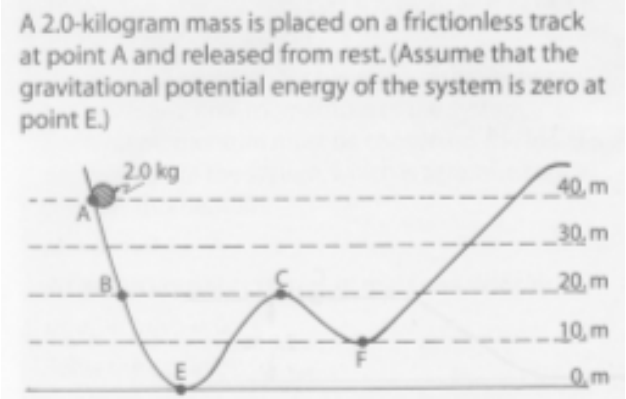
Use the diagram below to answer questions #5- 9



5) Determine the gravitational potential energy at point A.

6) Compared to the kinetic energy of the mass at point B, the kinetic energy of the mass at point E is
(a) the same (b) twice as great (c) half as great (d) four times as great

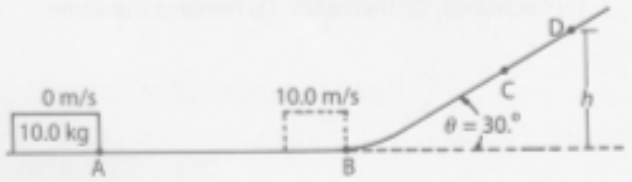
7) On the diagram mark an X on the track to indicate the maximum height the mass will reach above point E after the object has passed through E.

8) If the mass was released from rest at point B, it's speed at point C would be?

9) How does the total mechanical energy of the system at point A, the total mechanical energy of the system at point B?

Use the diagram below for #10-15

A 10.0-kilogram box starts from rest at point A and is accelerated uniformly to point B in 4.0 seconds by the application of a constant horizontal force *F*. At point B, the speed of the box is 10.0 meters per second as it begins to move up a plane inclined at 30.° to the horizontal. (Neglect friction.)



10) Determine the kinetic energy of the box at point B.

11) Determine the magnitude of force F.

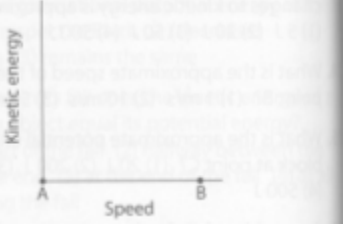
12) Determine the distance the box travels moving from A to B.

13) Compared to the impulse required to stop the box at point B, the impulse required to stop the box at point C is:

a) greater b) equal to c) less

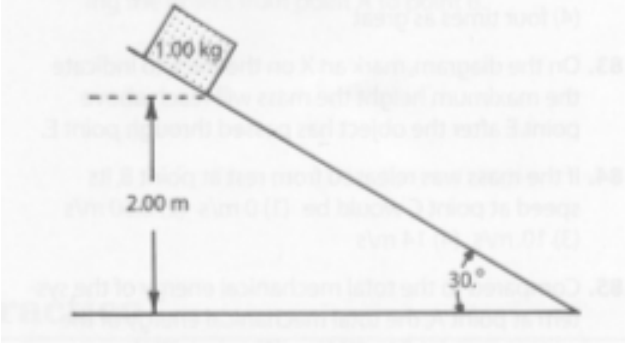
14) The box comes to rest at a vertical height of *h* (point D) when $\angle\theta = 30.°$. If $\angle\theta$ was increased to 40.°, the box would come to rest at a vertical height
(1) less than *h* (2) greater than *h* (3) equal to *h*

15) On the axes below, sketch a line to represent the relationship between the kinetic energy of the box and its speed as it travels from point A to point B.



Use the diagram below for #16-20

A 1.00-kilogram block is held at rest on a frictionless plane inclined at 30.° to the horizontal.



16) Determine the gravitational potential energy at the top of the incline.

17. How much kinetic energy does the block have at the bottom of the incline?

18) What is the blocks speed at the bottom?

19) If the angle between the plane and the horizontal is increased, the magnitude of the force required to hold the block at rest on the incline will
(a) decrease (b) increase (c) remain the same

20) As the block slides down the incline, the sum of it's gravitational potential energy and kinetic energy
(a) decreases (b) increases (c) remains the same