

Chapter 6

I lift a barbell with a mass of 50 kg up a distance of 0.70 m. Then I let the barbell come back down to where I started. How much net work did I do on the barbell?

- A) - 340 J
- B) 0 J
- C) + 35 J
- D) + 340 J
- E) + 690 J

You lift a 10 N physics book up in the air a distance of 1 meter at a constant velocity of 0.5 m/s. The work done by gravity is

- A) +10 J
- B) -10 J
- C) +5 J
- D) -5 J
- E) zero

Chapter 6

In which of the following situations will there be an increase in kinetic energy?

- A) A projectile approaches its maximum height
- B) A box is pulled across a floor at a constant speed.
- C) A child is pushing a merry-go-round causing it to rotate faster.
- D) A satellite travels in a circular orbit around a planet at a fixed altitude.
- E) A stone at the end of a string is whirled in a horizontal circle at a constant speed.

Two marbles, one twice as heavy as the other, are dropped to the ground from the roof of a building. Just before hitting the ground, the heavier marble has

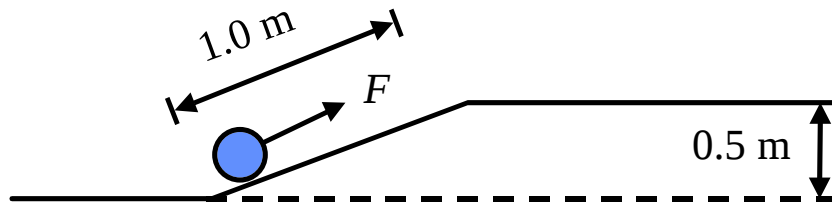
- A) as much kinetic energy as the lighter one.
- B) twice as much kinetic energy as the lighter one.
- C) half as much kinetic energy as the lighter one.
- D) four times as much kinetic energy as the lighter one.
- E) impossible to tell.

Chapter 6

A 40 N book is carried up a flight of stairs which is 25 m long and 8 m high. What is the change in potential energy of the book?

- A) 0 J
- B) 5 J
- C) 40 J
- D) 320 J
- E) 1000 J

At a bowling alley, the ball feeder must exert a force to push a 5.0 kg bowling ball up a 1.0 m long ramp. The ramp raises the ball 0.5 m above the base of the ramp. Approximately how much force must be exerted on the bowling ball.



- A) 200 N
- B) 50 N
- C) 25 N
- D) 5.0 N
- E) Not enough info to tell

Chapter 6

Suppose you wanted to ride your mountain bike up a steep hill. Two paths lead from the base to the top, one twice as long as the other. Compared to the average force you would exert if you took the short path, the average force you exert along the longer path is

- A) four times as small.
- B) three times as small.
- C) half as small.
- D) the same.
- E) it depends on the time taken.

In which system is there a decrease in potential energy?

- A) A boy stretches a spring.
- B) A child slides down a sliding board.
- C) A crate rests at the bottom of an inclined plane.
- D) A car ascends up a steep hill.
- E) Water is forced upward through a pipe.

Chapter 6

A ball drops some distance and gains 30 J of kinetic energy. Do not ignore air resistance. How much gravitational potential energy did the ball lose?

- A) More than 30 J
- B) Exactly 30 J
- C) Less than 30 J
- D) It depends on the mass of the ball.
- E) More information is needed to determine the answer.

A stone is thrown upward into the air. In addition to the force of gravity, the stone is subject to air resistance. The time the stone takes to reach the top of its flight is

- A) larger than
- B) equal to
- C) smaller than

the time it takes to return from the top to its original position

Chapter 6

A 3.0 kg block falls a distance of 6 m in a tube with no air resistance near the surface of the earth. What is its speed after it has covered the 6 m distance?

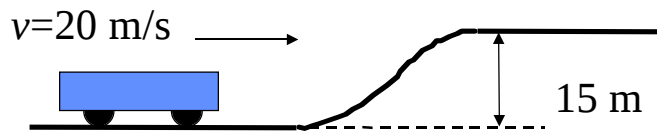
- A) 8 m/s
- B) 11 m/s
- C) 13 m/s
- D) 118 m/s
- E) 176 m/s

A woman stands on the edge of a cliff. She throws a stone *vertically downward* with an initial speed of 10 m/s. The instant before the stone hits the ground below, it has 450 J of kinetic energy. If she were to throw the stone *horizontally outward* from the cliff with the same initial speed of 10 m/s, how much kinetic energy would it have just before it hits the ground?

- A) 50 J
- B) 100 J
- C) 450 J
- D) 800 J
- E) Not enough information was given to answer the question

Chapter 6

A roller coaster travels along a straight path at a speed of 20 m/s. What would its speed be after climbing a 15 m hill if friction is ignored?



- A) 3 m/s
- B) 5 m/s
- C) 10 m/s
- D) 14 m/s
- E) 17 m/s

Suppose you wanted to ride your mountain bike down a steep hill. Two paths lead from the top to the base, one twice as long as the other. Neglect friction and air resistance. Compared to the maximum speed you would reach if you took the short path, the maximum speed you will reach along the longer path is

- A) one quarter as fast.
- B) twice as fast.
- C) the same speed.
- D) half as fast.
- E) four times as fast.

Chapter 6

A spring loaded toy dart gun shoots a dart straight up in the air and the dart reaches a maximum height of 24 m. The same dart is shot straight up a second time but this time the spring is compressed only half as far. How far up does the dart go this time neglecting friction?

- A) 96 m
- B) 48 m
- C) 24 m
- D) 12 m
- E) 6 m

How much energy is dissipated in braking a 1000 kg car to a stop from an initial speed of 30 m/s?

- A) 30,000 J
- B) 200,000 J
- C) 450,000 J
- D) 850,000 J
- E) 900,000 J

Chapter 6

A cart on an air track is moving at 0.5 m/s when the air is suddenly turned off. The cart comes to rest in 1 m . The experiment is repeated with the cart moving at 1 m/s when the air is turned off. How far does the cart travel before coming to rest?

- A) 1 m
- B) 2 m
- C) 3 m
- D) 4 m
- E) impossible to determine

A 4 kg mass with a speed of 2 m/s , and a 2 kg mass with a speed of 4 m/s , are gliding over a horizontal frictionless surface. Both objects encounter the same horizontal force, which opposes their motion, and are brought to rest. Which statement best describes their stopping distances?

- A) The 4 kg mass travels twice as far as the 2 kg mass before stopping.
- B) The 2 kg mass travels twice as far as the 4 kg mass before stopping.
- C) Both mass have the same stopping distance.
- D) the 2 kg mass travels farther, but not necessarily twice as far.

Chapter 6

A 50 kg woman runs up a flight of stairs in 5 s. Her net upward displacement is 5 m. What power did the woman exert while she was running?

- A) 250 W
- B) 750 W
- C) 0.5 kW
- D) 1.0 kW
- E) 5 kW

A car accelerates from 0 to 30 mph in 1.5 s. How long does it take for it to accelerate from 0 to 60 mph assuming the power of the engine to be independent of velocity and neglecting friction?

- | | |
|----------|----------|
| A) 2.0 s | B) 3.0 s |
| C) 4.5 s | D) 6.0 s |
| E) 9.0 s | |