

**4 Chapter Test C****Key Concepts**

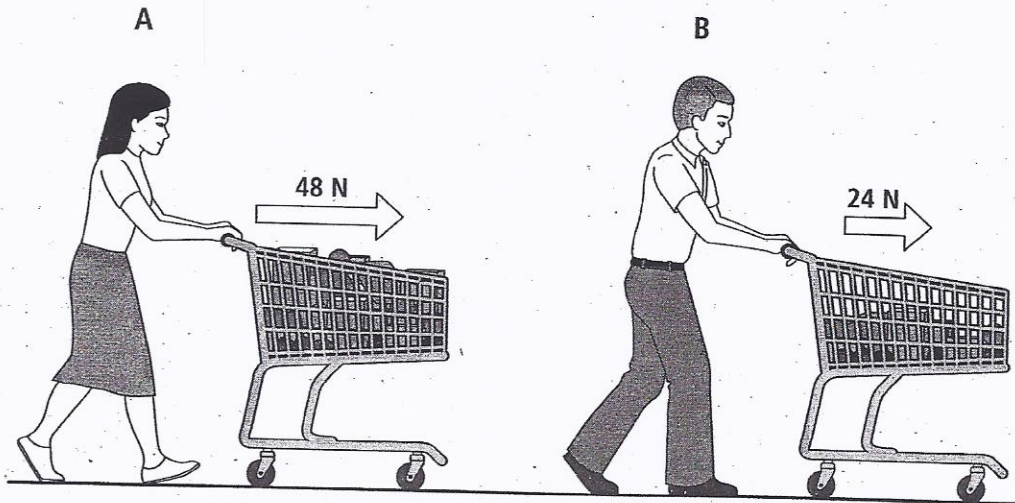
Choose the letter of the best answer. (4 points each)

- \_\_\_\_\_ 1. For work to be done on an object,
- a force must act on the object and the object must move
  - an upward force must act on the object whether the object moves or not
  - an equal but opposite force must be applied to the object
  - the object must accelerate over a specified distance
- \_\_\_\_\_ 2. If you want to double the work you do on an object, you can
- double the force or the distance
  - double the force and the distance
  - double the force and divide the distance by two
  - divide the force by two and double the distance
- \_\_\_\_\_ 3. Vanessa pushes a ball, causing it to roll. Vanessa
- increases the ball's kinetic energy by doing work
  - increases the ball's kinetic energy without doing work
  - decreases the ball's kinetic energy by doing work
  - decreases the ball's kinetic energy without doing work
- \_\_\_\_\_ 4. A painter carries a paint can to the top of a ladder. If the painter has a mass ten times greater than the mass of the paint can, then the painter's gravitational potential energy is
- $\frac{1}{10}$  that of the paint can
  - the same as that of the paint can
  - 10 times that of the paint can
  - 100 times that of the paint can
- \_\_\_\_\_ 5. Soraya rolls a 7 kg bowling ball. If she rolls the ball at a certain speed, the ball has a kinetic energy of 128 J. If she rolls the ball at half that speed, the kinetic energy will be
- 256 J
  - 128 J
  - 64 J
  - 32 J

- \_\_\_\_\_ 6. Suppose that you know the total mechanical energy of an object and its kinetic energy. You could find the object's potential energy by
- adding its kinetic and mechanical energies
  - dividing its mechanical energy by its kinetic energy
  - subtracting its kinetic energy from its mechanical energy
  - multiplying its kinetic and mechanical energies
- \_\_\_\_\_ 7. Jason applies a 250 N force for 20 s to slide a box 10 m across the floor. What is Jason's power?
- 2500 W
  - 250 W
  - 125 W
  - 1250 W
- \_\_\_\_\_ 8. David uses a drill to dig a well. He has only a certain length of time in which to dig the well. To increase the amount of work he does in that amount of time, he should
- decrease the energy used by the drill
  - decrease the force he applies to the drill
  - increase the power of the drill
  - increase the mass of the drill
- \_\_\_\_\_ 9. The power an appliance needs depends upon
- the rate it uses energy
  - the total energy it uses
  - the cost of the energy it uses
  - the way in which the energy is transferred
- \_\_\_\_\_ 10. Electric companies charge for their services according to the total energy used. Carlos has three lamps and uses one 100 W bulb, one 75 W bulb, and one 60 W bulb. If they each burn for the same length of time, which will cost the most to run?
- the 100 W bulb
  - the 75 W bulb
  - the 60 W bulb
  - They will cost the same.

**Math in Science**

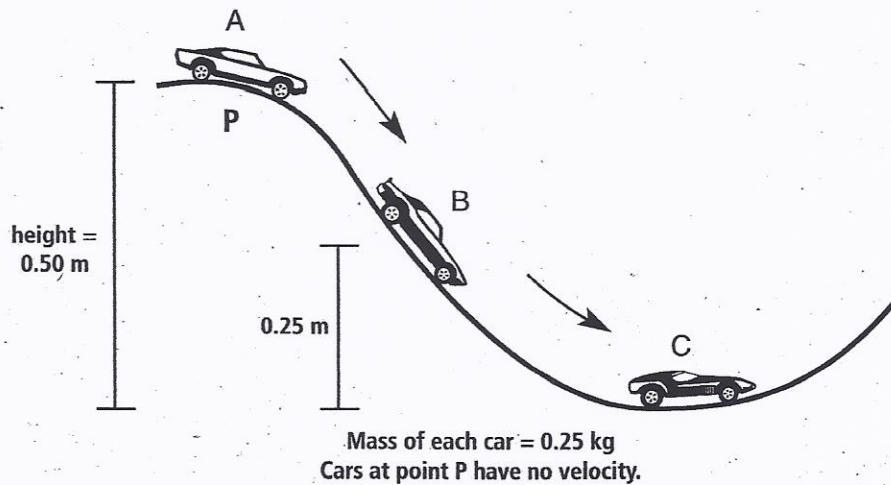
Using the drawing, answer the following questions. (7 points each)



11. If it takes 1440 J of work to push cart A down the aisle of a supermarket, how long is the aisle? The formula for work is  $W = Fd$ .
- \_\_\_\_\_
12. How much work would it take to push cart B halfway down the same aisle?
- \_\_\_\_\_
13. A store worker uses 48 watts of power to push cart B 10 m. How long does it take the worker to push the cart? The formula for power is  $P = \frac{W}{t}$ .
- \_\_\_\_\_
14. Which requires more power, pushing cart A 20 m in 12 s or pushing cart B 40 m in 8 s?
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Interpreting Visuals

Using the drawing, answer the following questions. (7 points each)



15. How does the kinetic energy of Car B compare with the total mechanical energy of Car A?

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16. Without knowing Car C's velocity, how can you find its kinetic energy?

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## Extended Response

Answer the following questions on the back of this paper or on a separate sheet of paper. (6 points each)

17. **Analyzing** Xavier has to pull a loaded wagon across the street. He wants to maximize the amount of work he does for the force he applies. At what angle should he pull the wagon handle to achieve his goal? Why?
18. **Explaining** How could you find out how much work you do when you climb a flight of stairs? Consider the relationship between work and energy. What sort of energy do you gain when you climb stairs?
19. **Inferring** When you roll a ball across a carpet, it slows down and eventually stops. What can you infer about what happens as the ball moves? Explain how the ball's kinetic energy and total mechanical energy change.