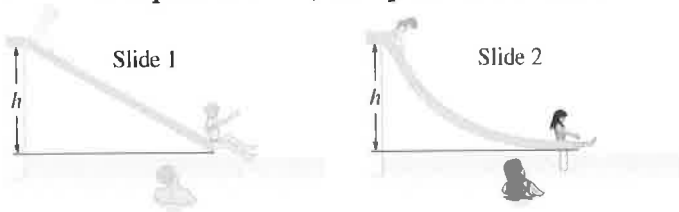


**Ch6 Review**

## 6.1 Conceptual Questions

- \_\_\_\_\_ 1) Person X pushes twice as hard against a stationary brick wall as person Y. Which one of the following statements is correct?  
A) Both do positive work, but person X does four times the work of person Y. B) Both do positive work, but person X does twice the work of person Y. C) Both do the same amount of positive work. D) Both do zero work. E) Both do positive work, but person X does one-half the work of person Y.
- \_\_\_\_\_ 2) A 35-N bucket of water is lifted vertically 3.0 m and then returned to its original position. How much work did gravity do on the bucket during this process?  
A) 180 J B) 90 J C) 45 J D) 0 J E) 900 J
- \_\_\_\_\_ 3) You throw a baseball straight up. Compare the sign of the work done by gravity while the ball goes up with the sign of the work done by gravity while it goes down.  
A) The work is positive on the way up and positive on the way down. B) The work is positive on the way up and negative on the way down. C) The work is negative on the way up and positive on the way down. D) The work is negative on the way up and on the way down because gravity is always downward.
- \_\_\_\_\_ 4) Which one has larger kinetic energy: a 500-kg object moving at 40 m/s or a 1000-kg object moving at 20 m/s?  
A) The 500-kg object B) The 1000-kg object C) Both have the same kinetic energy.
- \_\_\_\_\_ 5) A truck has four times the mass of a car and is moving with twice the speed of the car. If  $K_t$  and  $K_c$  refer to the kinetic energies of truck and car respectively, it is correct to say that  
A)  $K_t = 16K_c$ . B)  $K_t = 4K_c$ . C)  $K_t = 2K_c$ . D)  $K_t = K_c$ . E)  $K_t = \frac{1}{2}K_c$ .
- \_\_\_\_\_ 6) A 4.0 kg object is moving with speed 2.0 m/s. A 1.0 kg object is moving with speed 4.0 m/s. Both objects encounter the same constant braking force, and are brought to rest. Which object travels the greater distance before stopping?  
A) the 4.0 kg object B) the 1.0 kg object C) Both objects travel the same distance. D) It cannot be determined from the information given.
- \_\_\_\_\_ 7) A stone is held at a height  $h$  above the ground. A second stone with four times the mass of the first one is held at the same height. The gravitational potential energy of the second stone compared to that of the first stone is  
A) one-fourth as much. B) one-half as much. C) twice as much. D) four times as much. E) the same.

- 8) You and your friend, who weighs the same as you, want to go to the top of the Eiffel Tower. Your friend takes the elevator straight up. You decide to walk up the spiral stairway, taking longer to do so. Compare the gravitational potential energy of you and your friend, after you both reach the top.  
 A) It is impossible to tell, since the times you both took are unknown. B) It is impossible to tell, since the distances you both traveled are unknown. C) Your friend's gravitational potential energy is greater than yours, because he got to the top faster. D) Both of you have the same amount of gravitational potential energy at the top. E) Your gravitational potential energy is greater than that of your friend, because you traveled a greater distance in getting to the top.
- 9) When you drop a pebble from height  $H$ , it reaches the ground with speed  $V$  if there is no air resistance. From what height should you drop it so it will reach the ground with twice speed?  
 A)  $\sqrt{2}H$  B)  $2H$  C)  $4H$  D)  $8H$  E)  $16H$
- 10) Swimmers at a water park have a choice of two frictionless water slides, as shown in the figure. Although both slides drop over the same height  $h$ , slide 1 is straight while slide 2 is curved, dropping quickly at first and then leveling out. How does the speed  $v_1$  of a swimmer reaching the bottom of slide 1 compare with  $v_2$ , the speed of a swimmer reaching the end of slide 2?



- A)  $v_1 > v_2$  B)  $v_1 < v_2$  C)  $v_1 = v_2$  D) The heavier swimmer will have a greater speed than the lighter swimmer, no matter which slide he uses. E) No simple relationship exists between  $v_1$  and  $v_2$ .

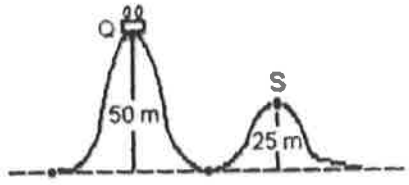
### 6.2 Problems

- 11) A child does 350 J of work while pulling a box from the ground up to his tree house at a steady speed with a light rope. The tree house is 4.0 m above the ground. What is the mass of the box?  
 A) 8.9 kg B) 5.3 kg C) 6.7 kg D) 8.0 kg
- 12) You carry a 7.0-kg bag of groceries 1.2 m above the ground at constant speed across a 2.7 m room. How much work do you do on the bag in the process?  
 A) 0.00 J B) 82 J C) 185 J D) 157 J
- 13) When a car of mass 1167 kg accelerates from 10.0 m/s to some final speed,  $4.00 \times 10^5$  J of work are done. Find this final speed.  
 A) 28.0 m/s B) 22.4 m/s C) 25.2 m/s D) 30.8 m/s
- 14) A 10-kg dog is running with a speed of 5.0 m/s. What is the minimum work required to stop the dog in 2.40 s?  
 A) 50 J B) 75 J C) 100 J D) 125 J

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- 15) The figure shows a famous roller coaster ride. You can ignore friction. If the roller coaster leaves point Q from rest, what is its speed at the top of the 25-m peak (point S)?



- A) 10 m/s B) 22 m/s C) 44 m/s D) 62 m/s E) 120 m/s