Name: _____ Class: _____ Date: _____ ID: A

¡WORKSHEET!

Worksheet - Ch 2 linear motion (2005)

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

____ 1. A change in a physical quantity w having initial value w_i and final value w_f is given by which of the following?
   a. $w_i - w_f$
   b. $w_f - w_i$
   c. $(w_f + w_i)/2$
   d. $(w_f - w_i)/2$
   e. none of the above

____ 2. Displacement is which of the following types of quantities?
   a. vector
   b. scalar
   c. magnitude
   d. dimensional

____ 3. An object moves 20 m east in 30 s and then returns to its starting point taking an additional 50 s. If west is chosen as the positive direction, what is the average speed of the object?
   a. 0.50 m/s
   b. -0.50 m/s
   c. 0.73 m/s
   d. 0 m/s
   e. -0.73 m/s

____ 4. A bird, accelerating from rest at a constant rate, experiences a displacement of 28 m in 11 s. What is the average velocity?
   a. 1.7 m/s
   b. 2.5 m/s
   c. 3.4 m/s
   d. 4.2 m/s
   e. zero

____ 5. A cheetah can run at approximately 100 km/hr and a gazelle at 80.0 km/hr. If both animals are running at full speed, with the gazelle 70.0 m ahead, how long before the cheetah catches its prey?
   a. 12.6 s
   b. 25.2 s
   c. 6.30 s
   d. 10.7 s
   e. 20.3 s

____ 6. A cheetah can maintain its maximum speed of 100 km/hr for 30.0 seconds. What minimum distance must a gazelle running 80.0 km/hr be ahead of the cheetah to escape?
   a. 100 m
   b. 167 m
   c. 70.0 m
   d. 83.0 m
   e. 184 m

____ 7. A railroad train travels forward along a straight track at 80.0 m/s for 1 000 m and then travels at 50.0 m/s for the next 1 000 m. What is the average velocity?
a. 65.0 m/s
b. 61.5 m/s
c. 63.7 m/s
d. 70.0 m/s
e. 68.3 m/s

____ 8. The distance of the Earth from the sun is 93 000 000 miles. If there are 3.15×10^7 s in one year, find the speed of the Earth in its orbit about the sun.
a. 9.28 miles/s
b. 18.6 miles/s
c. 27.9 miles/s
d. 37.2 miles/s
e. 41.3 miles/s

____ 9. A ball is thrown vertically upwards at 19.6 m/s. For its complete trip (up and back down to the starting position), its average velocity is:
a. 19.6 m/s.
b. 9.80 m/s.
c. 4.90 m/s.
d. 20.1 m/s.
e. not given.

____ 10. Changing the positive direction in a reference frame to the opposite direction does not change the sign of which of the following quantities?
a. velocity
b. average velocity
c. speed
d. displacement
e. acceleration

____ 11. A European sports car dealer claims that his car will accelerate at a constant rate from rest to 100 km/hr in 8.00 s. If so, what is the acceleration? *(Hint:* First convert speed to m/s.)
a. 3.47 m/s^2
b. 6.82 m/s^2
c. 11.4 m/s^2
d. 17.4 m/s^2
e. 19.5 m/s^2

____ 12. A European sports car dealer claims that his product will accelerate at a constant rate from rest to a speed of 100 km/hr in 8.00 s. What is the speed after the first 5.00 s of acceleration? (*Hint:* First convert the speed to m/s.)
a. 34.7 m/s
b. 44.4 m/s
c. 28.7 m/s
d. 17.4 m/s
e. 15.2 m/s

____ 13. An x vs. t graph is drawn for a ball moving in one direction. The graph starts at the origin and at $t = 5$ s the velocity of the ball is zero. We can be positive that at $t = 5$ s,
a. the slope of the curve is non-zero.
b. the ball has stopped.
c. the acceleration is constant.
d. the curve is at $x = 0$, $t = 0$.
e. the slope of the curve is zero.

____ 14. A v vs. t graph is drawn for a ball moving in one direction. The graph starts at the origin and at $t = 5$ s the acceleration of the ball is zero. We know that at $t = 5$ s,
a. the slope of the curve is non-zero.
b. the velocity of the ball is not changing.
c. the curve is not crossing the time axis.
d. the curve is at $v = 0$, $t = 0$.
e. the velocity of the ball is zero.

____ 15. The value of an object's acceleration may be characterized in equivalent words by which of the following?
a. displacement
b. rate of change of displacement
c. velocity
d. rate of change of velocity
e. the change of velocity

____ 16. When a drag strip vehicle reaches a velocity of 60 m/s, it begins a negative acceleration by releasing a drag chute and applying its brakes. While reducing its velocity back to zero, its acceleration along a straight line path is a constant -7.5 m/s^2. What displacement does it undergo during this deceleration period?
a. 40 m
b. 80 m
c. 160 m
d. 240 m
e. 310 m

____ 17. Two objects of different mass are released simultaneously from the top of a 20-m tower and fall to the ground. If air resistance is negligible, which statement best applies?
a. The greater mass hits the ground first.
b. Both objects hit the ground together.
c. The smaller mass hits the ground first.
d. No conclusion can be made with the information given.

____ 18. At the top of a cliff 100 m high, Raoul throws a rock upward with velocity 15.0 m/s. How much later should he drop a second rock from rest so both rocks arrive simultaneously at the bottom of the cliff?
a. 5.05 s
b. 3.76 s
c. 2.67 s
d. 1.78 s
e. 1.56 s

____ 19. Mt. Everest is more than 8 000 m high. How fast would an object be moving if it could free fall to sea level after being released from an 8000-m elevation? (Ignore air resistance.)
a. 396 m/s
b. 120 m/s
c. 1 200 m/s
d. 12 000 m/s
e. 521 m/s

____ 20. A basketball player can jump 1.6 m off the hardwood floor. With what upward velocity did he leave the floor?
a. 1.4 m/s
b. 2.8 m/s
c. 4.2 m/s
d. 5.6 m/s
e. 6.5 m/s

____ 21. A ball is pushed with an initial velocity of 4.0 m/s. The ball rolls down a hill with a constant acceleration of 1.6 m/s^2. The ball reaches the bottom of the hill in 8.0 s. What is the ball's velocity at the bottom of the hill?
a. 10 m/s
b. 12 m/s
c. 16 m/s
d. 17 m/s
e. 19 m/s

____ 22. An automobile driver puts on the brakes and decelerates from 30.0 m/s to zero in 10.0 s. What distance does the car travel?
a. 150 m
b. 196 m
c. 336 m
d. 392 m
e. 421 m

____ 23. A rock is thrown straight up with an initial velocity of 19.6 m/s. What time interval elapses between the rock's being thrown and its return to the original launch point? (Acceleration due to gravity is 9.80 m/s^2.)
a. 4.00 s
b. 5.00 s
c. 8.00 s
d. 10.0 s
e. 15.0 s

____ 24. A water rocket, launched from the ground, rises vertically with acceleration of 30 m/s^2 for 1.0 s when it runs out of "fuel." Disregarding air resistance, how high will the rocket rise?
a. 15 m
b. 31 m
c. 61 m
d. 120 m
e. 132 m