CH 2, 3, & 6 PHYSICS REVIEW - MOTION

1. Jake walks east through a passenger car on a train that moves 10 m/s in the same direction. Jake's speed relative to the car is 2 m/s. Jake's speed relative to an observer at rest outside the train is
   a. 2 m/s.
   b. 5 m/s.
   c. 8 m/s.
   d. 12 m/s.

2. A gazelle travels 2 km in a half hour. The gazelle's average speed is
   a. 1/2 km/h.
   b. 1 km/h.
   c. 2 km/h.
   d. 4 km/h.

3. Constant speed in a constant direction is
   a. constant velocity.
   b. constant acceleration.
   c. instantaneous speed.
   d. average velocity.

4. A vehicle undergoes acceleration when it
   a. gains speed.
   b. decreases speed.
   c. changes direction.
   d. all of the above

5. If a falling object gains 10 m/s each second it falls, its acceleration can be expressed as
   a. 10 m/s/s.
   b. 10 m/s^2.
   c. v = gt.
   d. both A and B.

6. The slope of a speed-versus-time graph represents
   a. distance traveled.
   b. velocity.
   c. acceleration.
   d. air resistance.

7. If an object has an acceleration of 0 m/s^2, then one can be sure that the object is not ____.
   a. Moving b. Changing position c. Changing velocity

8. A rock falls 180 m from a cliff into the ocean. How long is it in free fall?
   a. 6 s
   b. 10 s
   c. 18 s
   d. 180 s

9. When no air resistance acts on a projectile, its horizontal acceleration is
   a. *g*.
   b. at right angles to *g*.
   c. upward, *g*.
   d. zero.

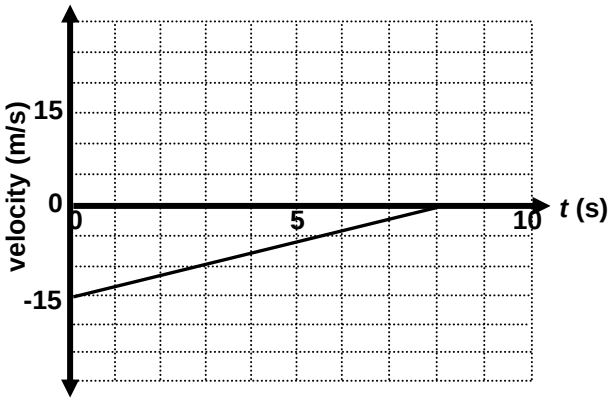
10. Without air resistance, the time for a vertically tossed ball to return to where it was thrown is
    a. 10 m/s for every second in the air.
    b. the same as the time going upward.
    c. less than the time going upward.
    d. more than the time going upward.

11. A fullback is running down the football field in a straight line. He starts at the 0-yard line at 0 seconds. At 1 second, he is on the 10-yard line; at 2 seconds, he is on the 20-yard line; at 3 seconds, he is on the 30-yard line; and at 4 seconds, he is on the 40-yard line. What is the player's acceleration?
    No horizontal acceleration, O m/s^2

12. Olympic gold medalist Michael Johnson runs one time around the track - 400 meters - in 38 seconds. What is his displacement?
    0 meter displacement

13. If an object is moving eastward and slowing down, then the direction of its velocity vector is ____.
    a. eastward b. westward c. neither d. not enough info to tell

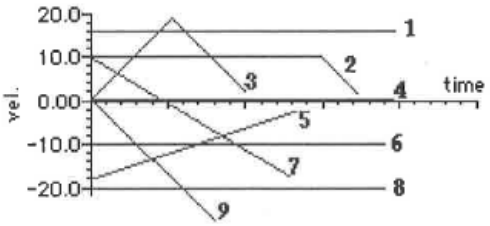
Use the graph to answer the following questions.



14. Describe the motion of the object.
Starts with a high negative velocity (-15m/s) and then starts to slow down (+ acceleration) to 0 m/s in 8 seconds.

15. Determine the acceleration of the object from the graph.
1.875 m/s^2

Consider the velocity-time graph at the right for several different objects, each represented by a numbered line.



Use the graph to answer the next several questions. For each question, there may be more than one line which applies.

16. Which object(s) is/are moving with a constant velocity during the entire motion? 1, 4, 6, & 8

17. Which object(s) is/are speeding up during the entire motion? 9

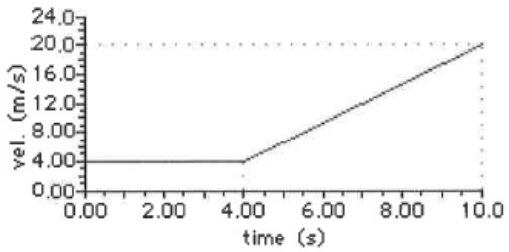
18. Which object(s) is/are slowing down during the entire motion? 5

19. Which object(s) change(s) direction at anytime during the motion? 7

20. Which object(s) is/are moving with a positive acceleration at any time during the motion? 3 & 5

21. Which object(s) is/are moving with a negative acceleration at any time during the motion? 3, 7, 9, & 2

22. Consider the velocity-time graph below.



Determine the acceleration (in m/s/s) of the object at 8 seconds.

2.7 m/s^2