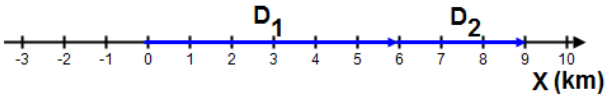
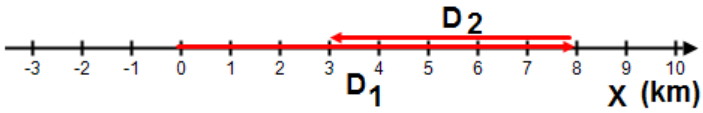
2016 1st Semester 1st Quarter Physics 3rd worksheet for grade 11th.

Name:-_____ Section _____ No. _____

Unit 3 Motion in one and two dimensions

1. An object moves at a constant speed of 6 m/s. This means that the object:
   A. Increases its speed by 6 m/s every second
   B. Decreases its speed by 6 m/s every second
   C. Doesn't move
   D. Has a positive acceleration
   E. Moves 6 meters every second





2. Starting from the origin, a person walks 6 km east during first day, and 3 km east the next day. What is the net displacement of the person from the initial point in two days?
   A. 6 km, west
   B. 3 km, east
   C. 10 km, east
   D. 5 km, west
   E. 9 km, east

   The diagram above (right) illustrates a person who, starting from the origin, walks 8 km east during first day, and 5 km west the next day. Use it to answer the next questions.
3. What is the net displacement of the person from the initial point in two days?
   A. 6 km, east
   B. 3 km, east
   C. 10 km, west
   D. 5 km, west
   E. 9 km, east
4. What is the traveled distance of the person from the initial point in two days?
   A. 13 km
   B. 3 km
   C. 10 km
   D. 5 km
   E. 9 km
5. An object moves with a constant acceleration of 5 m/s^2. Which of the following statements is true?
   A. The object's velocity stays the same.
   B. The object moves 5 m each second
   C. The object's acceleration increases by 5 m/s2 each second
   D. The object's acceleration decreases by 5 m/s2 each second
   E. the object's velocity increases by 5 m/s each second
6. Two objects are dropped from a bridge, an interval of 1.0 s apart. Air resistance is negligible. During the time that both objects continue to fall, their separation
   A) increases.
   B) decreases.
   C) stays constant.
   D) increases at first, but then stays constant.
7. Ball A is dropped from the top of a building. One second later, ball B is dropped from the same building. Neglect air resistance. As time progresses, the difference in their speeds
   A) increases.
   B) remains constant.
   C) decreases.
   D) cannot be determined
8. Which of the following situations is *impossible*?
   A) An object has velocity directed east and acceleration directed west.
   B) An object has velocity directed east and acceleration directed east.

C) An object has zero velocity but non-zero acceleration.
D) An object has constant non-zero acceleration and changing velocity.
E) An object has constant non-zero velocity and changing acceleration.

9. An object moving in the +*x* direction experiences an acceleration of +2.0 m/s2. This means the object
A) travels 2.0 m in every second. B) is decreasing its velocity by 2.0 m/s every second.
C) is traveling at 2.0 m/s. D) is increasing its velocity by 2.0 m/s every second.

10. A runner runs around a track consisting of two parallel lines 96 m long connected at the ends by two semicircles with a radius of 49 m. She completes one lap in 100 seconds. What is her average velocity?
A) 2.5 m/s B) 5.0 m/s C) 10 m/s D) 0 m/s E) 1.3 m/s

11. You drive 6.0 km at 50 km/h and then another 6.0 km at 90 km/h. Your average speed over the 12 km drive will be
A) greater than 70 km/h. B) equal to 70 km/h. C) less than 70 km/h. D) exactly 38 km/h.

12. A motorist travels 160 km at 80 km/h and 160 km at 100 km/h. What is the average speed of the motorist for this trip?
A) 84 km/h B) 89 km/h C) 90 km/h D) 91 km/h

13. An airplane increases its speed at the average rate of 15 m/s2. How much time does it take to increase its speed from 100 m/s to 160 m/s?
A) 17 s B) 0.058 s C) 4.0 s D) 0.25 s

14. A car and a delivery truck both start from rest and accelerate at the same rate. However, the car accelerates for twice the amount of time as the truck. What is the final speed of the car compared to the truck?
A. Half as much B. The same C. Twice as much D. Four times as much E. One quarter as much

15. A car and a delivery truck both start from rest and accelerate at the same rate. However, the car accelerates for twice the amount of time as the truck. What is the traveled distance of the car compared to the truck?
A. Half as much B. The same C. Twice as much D. Four times as much E. One quarter as much

16. A car travels at 15 m/s for 10 s. It then speeds up with a constant acceleration of 2.0 m/s2 for 15 s. At the end of this time, what is its velocity?
A) 15 m/s B) 30 m/s C) 45 m/s D) 375 m/s

17. An object is released from rest and falls in the absence of air resistance. Which of the following is true about its motion?
A. Its acceleration is zero B. Its acceleration is constant C. Its velocity is constant
D. Its acceleration is increasing E. Its velocity is decreasing

18. A jet plane is launched from a catapult on an aircraft carrier. In 2.0 s it reaches a speed of 42 m/s at the end of the catapult. Assuming the acceleration is constant, how far did it travel during those 2.0 s?
A) 16 m B) 24 m C) 42 m D) 84 m

19. A car increases its forward velocity uniformly from 40 m/s to 80 m/s while traveling a distance of 200 m. What is its acceleration during this time?
A) 8.0 m/s2 B) 9.6 m/s2 C) 12 m/s2 D) 24 m/s2

20. Assuming equal rates of uniform acceleration in both cases, how much further would you travel if braking from 56m/s to rest than from 28m/s?
A) 4 times farther B) 3.2 times farther C) 4.8 times farther D) 5.2 times farther

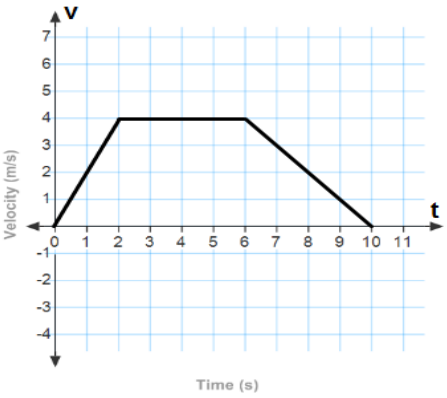
21. An object is moving in a straight line with constant acceleration. Initially it is traveling at 16 m/s. Three seconds later it is traveling at 10 m/s. How far does it move during this time?

A) 30 m B) 39 m C) 48 m D) 57 m

22. An object is moving with constant non-zero acceleration in the +*x* direction. The position versus time graph of this object is
A) a horizontal straight line. B) a vertical straight line.
C) a straight line making an angle with the time axis. D) a parabolic curve.

23. An object is moving with constant non-zero acceleration in the +*x* direction. The velocity versus time graph of this object is
A) a horizontal straight line. B) a vertical straight line.
C) a straight line making an angle with the time axis. D) a parabolic curve.

The velocity as a function of time of a moving object is presented by the graph to the right. Use this graph for the next 6 questions.



24. What is the acceleration of the object between 0 s and 2 s?
A. 0 m/s^2 B. 1 m/s^2 C. 2 m/s^2 D. 3 m/s^2 E. 4m/s^2

25. What is the acceleration of the object between 2 s and 6 s?
A. 0 m/s^2 B. 1 m/s^2 C. 2 m/s^2 D. 3 m/s^2 E. 4m/s^2

26. What is the magnitude of acceleration of the object between 6 s and 10 s?
A. 0 m/s^2 B. 1 m/s^2 C. 2 m/s^2 D. 3 m/s^2 E. 4m/s^2

27. How far from the origin does the object move in first 2 s?
A. 4 m B. 16 m C. 20 m D. 28 m E. 36 m

28. How far from the origin does the object move in first 6 s?
A. 4 m B. 16 m C. 20 m D. 28 m E. 36 m

29. How far from the origin does the object move in first 10 s?
A. 4 m B. 16 m C. 20 m D. 28 m E. 36 m

30. A 10-kg rock and 20-kg rock are dropped from the same height and experience no significant air resistance. If it takes the 20-kg rock a time *T* to reach the ground, what time will it take the 10-kg rock to reach the ground?
A) 4*T* B) 2*T* C) *T* D) *T*/2 E) *T*/4

31. If the velocity versus time graph of an object is a horizontal line, the object is
A) moving with zero acceleration. B) moving with constant non-zero acceleration.
C) at rest. D) moving with increasing speed.

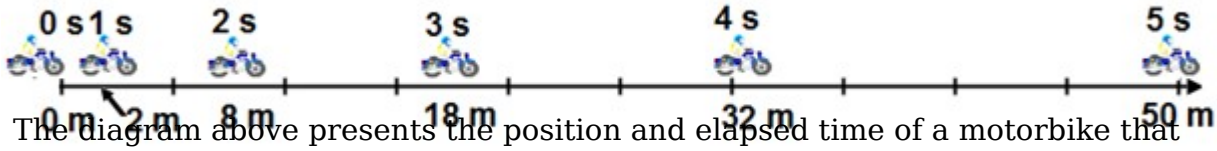
32. A train starts from rest and accelerates uniformly until it has traveled 2.1 km and acquired a forward velocity of 24m/s. The train then moves at a constant velocity for 400 s. The train then slows down uniformly at 0.065m/s^2 until it is brought to a halt. The distance traveled by the train while slowing down is closest to
A) 4.4 km. B) 4.2 km. C) 4.0 km. D) 3.8 km. E) 3.6 km.

33. The x and y coordinate of a particle moving in x-y plane at some instant are: $x=2t^2 \wedge y=\frac{3}{2}t^2$. Calculate the y coordinate when its x coordinate is 8 m.
A) 3 m B) 6 m C) 8 m D) 9 m

34. Human reaction time is usually greater than 0.10 s. If your friend holds a ruler between your fingers and releases it without warning, how far can you expect the ruler to fall before you catch it, assuming negligible air resistance?
A) At least 3.0 cm B) At least 4.9 cm C) At least 6.8 cm D) At least 9.8 cm

35. A car starts from rest and accelerates at a steady 6.00 m/s2. How far does it travel in the first 3.00 s?
A) 9.00 m B) 18.0 m C) 27.0 m D) 36.0 m E) 54.0 m

36. A car is traveling at 26.0 m/s when the driver suddenly applies the brakes, causing the car to slow down with constant acceleration. The car comes to a stop in a distance of 120 m. How fast was the car moving when it was 60.0 m past the point where the brakes were applied?
A) 22.5 m/s B) 18.4 m/s C) 15.0 m/s D) 12.1 m/s E) 9.20 m/s



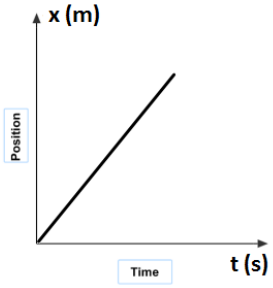
The diagram above presents the position and elapsed time of a motorbike that starts from rest and accelerates at a constant rate. Use it to answer questions 49 and 50.

37. What is the average velocity of the motorbike during first 5 s?
A. 0 m/s B. 5 m/s C. 10 m/s D. 15 m/s E. 20 m/s

38. What is the acceleration of the motorbike?
A. 0 m/s^2 B. 2 m/s^2 C. 4 m/s^2 D. 6 m/s^2 E. 8 m/s^2

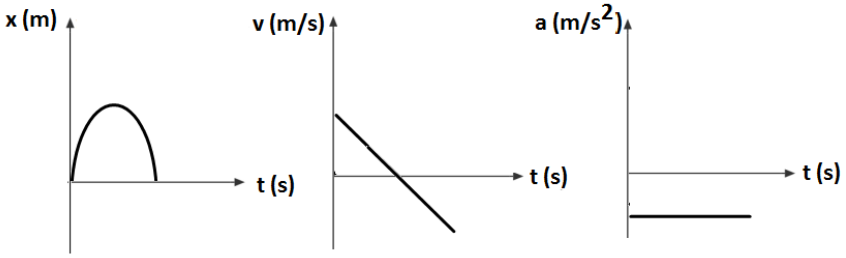
39. A particle moves in straight line. Its position is given by: $S(t)=27+24t-3t^2$. Find: a) the instantaneous velocity at t = 2, 4, 6, 8 and 9 sec. b) the distance traveled by the particle during t = 2, 4, 6, 8 and 9 sec. c) the displacement of the particle during t = 2, 4, 6, 8 and 9 sec. d) the time at which the instantaneous velocity be zero. e) the ratio of initial velocity and acceleration. f) draw the v-t graph of the particle during the first 9 sec. g) draw the s-t graph of the particle during the first 9 sec.

40. The position as a function of time of an object moving along x – axis is presented by the graph above. Which of the following statements is true?

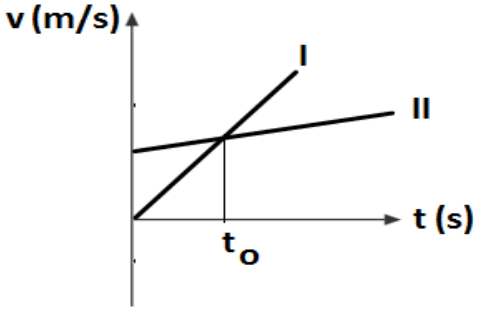


A. The velocity of the object is zero.
B. The acceleration of the object is zero.
C. At time t = 0 the object is at the origin.
D. The acc. of the object is a positive constant.

41. A tennis ball is thrown straight up and caught at the same height. Which of the following can describe the motion of the ball when it reaches the apex?
A. The velocity of the ball is zero. C. The acceleration of the ball is 9.8 m/s^2 down
B. The acceleration of the ball is zero. D. The acceleration of the ball is 9.8 m/s^2 up.



42. The position, velocity and acceleration as a function of time of a moving object are presented by the graph. Which of the following could be used to describe this type of motion?
(A) The object accelerates from rest at a constant rate.
(B) The object slows down at a constant acceleration.
(C) The object is thrown straight up.
(D) The object slides up and down the frictionless inclined plane.



43. The velocity as a function of time of two moving objects is presented by the graph above. Which of the following is true?

(A) At time t_0 object I is behind object II
(B) At time t_0 object II is behind object I
(C) Object I has a greater acceleration than object II
(D) Object II has a greater acceleration that object I

44. Under what condition is average velocity equal to the average of the object's initial and final velocity?
A) This can only occur if there is no acceleration.
B) The acceleration is constant.
C) This can occur only when the velocity is zero.
D) The acceleration must be constantly increasing.
E) The acceleration must be constantly decreasing.

45. An object is moving with constant non-zero acceleration in the +*x* direction. The position versus time graph of this object is
A) a horizontal straight line. B) a vertical straight line.
C) a straight line making an angle with the time axis. D) a parabolic curve.

46. An object is moving with constant non-zero acceleration in the +*x* direction. The velocity versus time graph of this object is
A) a horizontal straight line. B) a vertical straight line.
C) a straight line making an angle with the time axis. D) a parabolic curve.

47. If the velocity versus time graph of an object is a horizontal line, the object is
A) moving with zero acceleration. B) moving with constant non-zero acceleration.
C) at rest. D) moving with increasing speed.

48. Can an object's velocity equal zero when object's speed is greater than zero?
A. Yes, when the object moves in a straight line at a constant rate
B. Yes, when the accelerates in a straight line in one direction
C. Yes, when the object returns to its original position
D. No, it is impossible because they are always equal
E. No, it is impossible because the magnitude of the velocity is always greater that speed

49. You start from rest and accelerate with a given constant acceleration for a given distance. If you repeat the process with twice the acceleration, then the time required to travel the same distance
(a) remains the same (b) is doubled (c) is halved
(d) increases by a factor of $\sqrt{2}$ (e) decreases by a factor of $\sqrt{2}$

50. Which of the following answers is the best estimate for the time it takes an object dropped from rest to fall a vertical mile (about 1600 m)? Ignore air resistance, as usual.
(a) 5 s (b) 10 s (c) 20 s (d) 1 min (e) 5 min

51. A car travels with constant speed v0 on a highway. At the instant it passes a stationary police motorcycle, the motorcycle accelerates with constant acceleration and gives chase. What is the speed of the motorcycle when it catches up to the car (in an adjacent lane on the highway)? *Hint*: Draw the v vs. *t* plots on top of each other.
(a) v0 (b) 3v0/2 (c) 2v0 (d) 3v0 (e) 4v0