PHYSICS

BOOKS - R G PUBLICATION

MOTION

Example

1. An object has moved through a distance. Can it have zero displacement? If yes, support your answer with an example.

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2. A farmer moves along the boundary of a square field of side 10 m in 40 s. What will be the magnitude of displacement of the farmer at the end of 2 minutes 20 second from his initial position?

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3. Which of the following true for displacement?

(a) It cannot be zero.

(b) Its magnitude is greater than the distance travelled by the object.

(c) displacement may or may not be equal to distance

A. only a

B. b and c

C. only c

D. All a, b and c

Answer:

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4. Which of the following is true about distance and time.

A. (a) distance and time are always directly proportional to each other

B. (b) distance and time are always indirectly proportional to each other.

C. (c) distance and time are directly proportional when the velocity is constant

D. (d) D distance and time are indirectly proportional when the velocity is constant

Answer:

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5. Distinguish between speed and velocity.

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6. Under what condition the magnitude of average velocity is equal to the average speed ?

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7. What does the odometer of an automobile measure?

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8. What does the path of an object look like when it is in uniform motion?

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9. During an experiment, a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of light, that is, $3 \times 108ms^{-1}$

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10. When will you say a body is in (i) uniform acceleration? (ii) non- uniform acceleration?

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11. A bus decreases its speed from 80 km h^{-1} to 60 km h^{-1} in 5 s. Find the acceleration of the bus.

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12. A train starting from a railway station and moving with uniform acceleration attains a speed 40 km h^{-1} in 10 minutes. Find its acceleration.

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13. What is the nature of the distance time graphs for uniform and non-uniform motion of an object?

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14. What can you say about the motion of an object whose distance time graph is a straight line parallel to the time axis?

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15. What can you say about the motion of an object if its speed time graph is a straight line parallel to the time axis?

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16. What is the quantity which is measured by the area occupied below the velocity-time graph?

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17. A bus starting from rest moves with a uniform acceleration of 0.1 m s^{-2} for 2 minutes. Find (a) the speed acquired, (b) the distance travelled

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18. A train is travelling at a speed of 90 km h^{-1}. Brakes are applied so as to produce a uniform acceleration of – 0.5 m s^{-2}. Find how

far the train will go before it is brought to rest.

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19. A trolley, while going down an inclined plane, has an acceleration of 2 cm/ s^{-2}. What will be its velocity 3 s after the start?

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20. A racing car has a uniform acceleration of 4 m s^{-2}. What distance will it cover in 10 s after start?

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21. A stone is thrown in a vertically upward direction with a velocity of $5ms^{1}$. If the acceleration of the stone during its motion is $10ms^{-2}$ in the downward direction, what will

be the height attained by the stone and how much time will it take to reach there?

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22. An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at the end of 2 minutes 20 s?

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23. Joseph jogs from one end A to other end B of a straight 300 m road in 2 minutes 30 seconds and then turns around and jogs 100 m back to point C in another 1 minute. What are Joseph's average speed and velocities in jogging (a) from A to B and (b) from A to C?

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24. Abdul, while driving to school, computes the average speed for his trip to be

$20kmh-1$. On his return trip along the same route, there is less traffic and the average speed is $30kmh^{-1}$. What is the average speed for Abdul's trip?

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25. A motorboat starting from rest on a lake accelerate in a straight line at a constant of $3.0ms^{-2}$ for 8.0 s. How far does the boat travel during this time?

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26. A driver of a car travelling at $52kmh^{-1}$ applies the brakes and accelerates uniformly in the opposite direction. The car stops in 5 s. Another driver going at $3kmh^{-1}$ in another car applies his brakes slowly and stops in 10 s. On the same graph paper, plot the speed versus time graphs for the two cars. Which of the two cars travelle farther after the brakes were applied?

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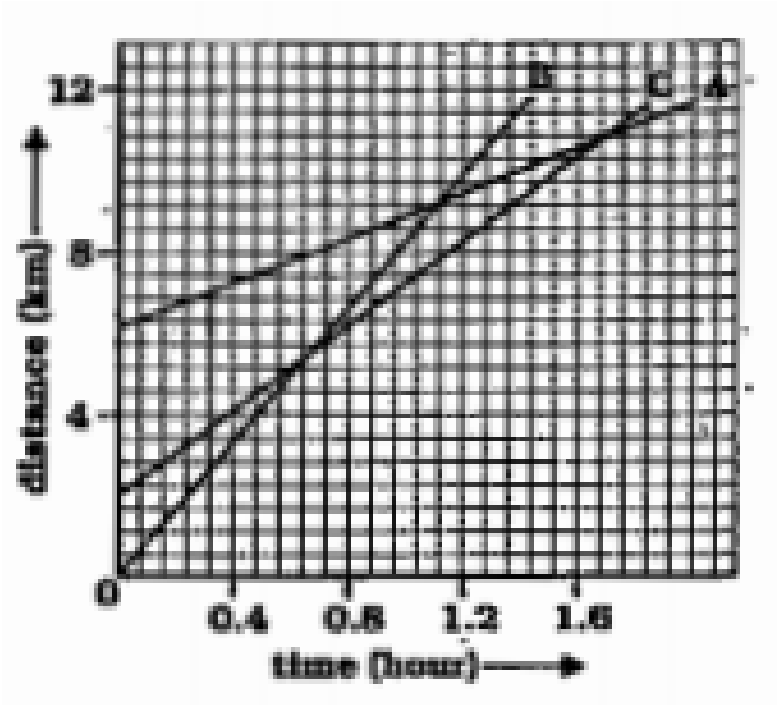
27.



In figure. shows the distance-time graph of three objects A, B and C. Study the graph and answer the following question: (a) Which of the three is travelling the fastest?

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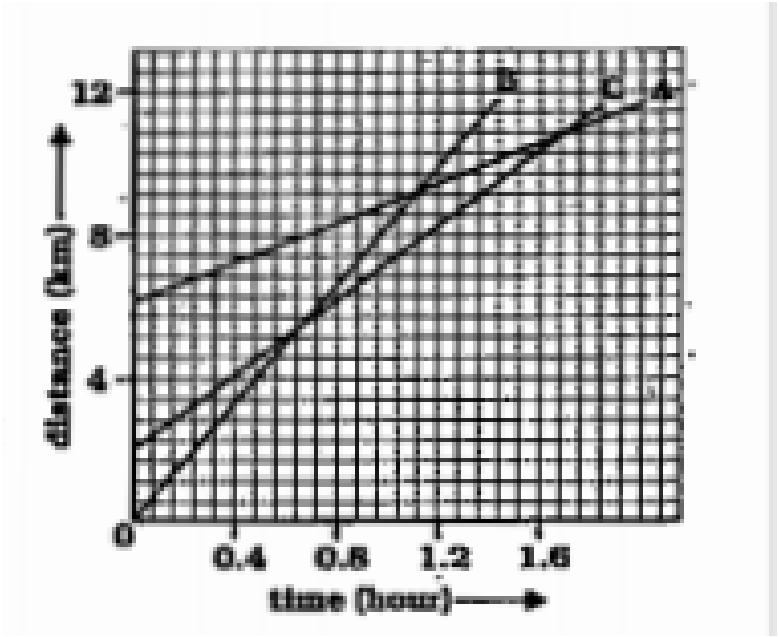
28.



In figure. shows the distance-time graph of three objects A, B and C. Study the graph and answer the following question: (B) Are all three ever at the same point on the road?

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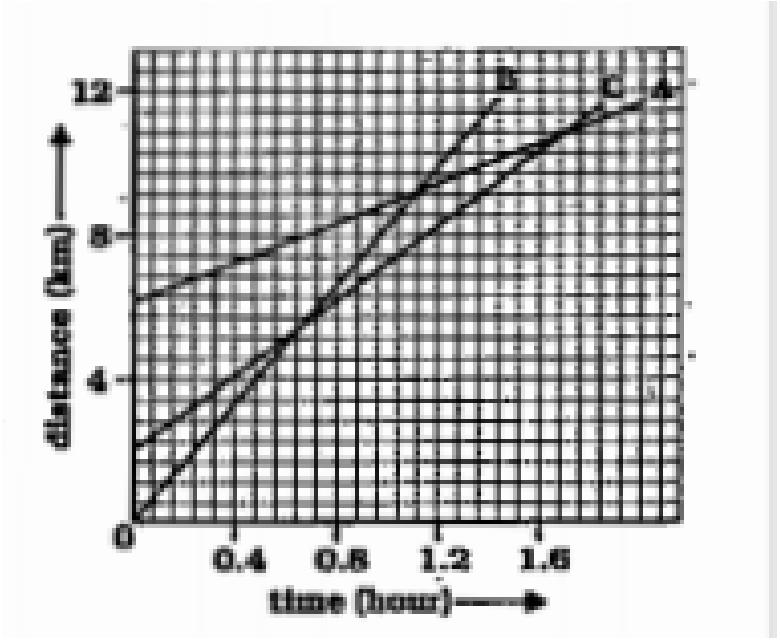
29.



In figure. shows the distance-time graph of three objects A, B and C. Study the graph and

answer the following questions: (C) How far has C travelled when B passes A?

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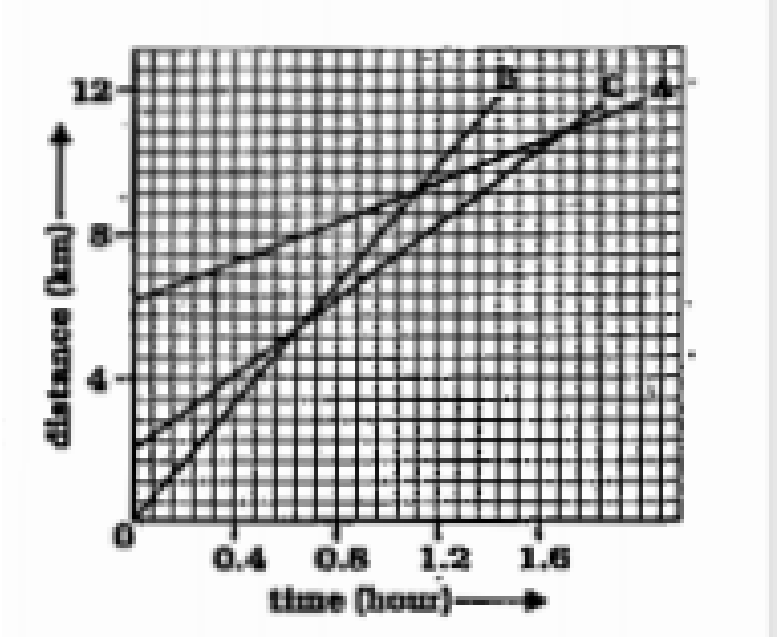
30.



In figure. shows the distance-time graph of

three objects A, B and C. Study the graph and answer the following questions:(d) How far has B travelled by the time it passes C?

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31. A ball is gently dropped from a height of 20 m. If its velocity increases uniformly at the rate of $10ms^{-2}$, with what velocity will it strike the ground? After what time will it strike the ground?

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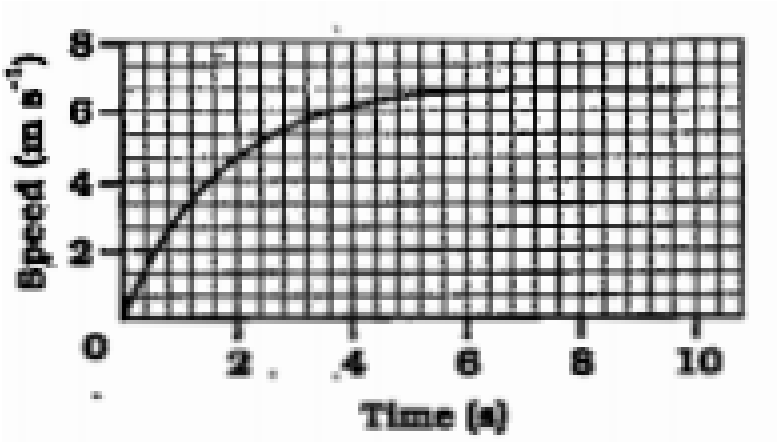
32. The speed time graph for a car is shown in the figure.



find how far is the car travel in the first 4 seconds. Shade the area on the graph that represents the distance travelled by the car during the period.

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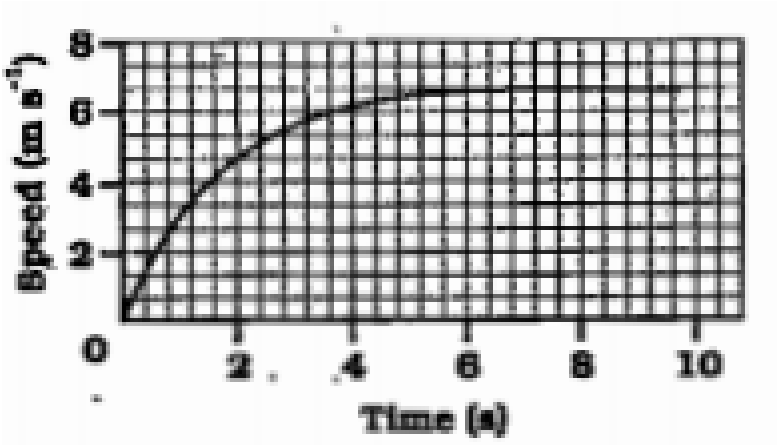
33. The speed time graph for a car is shown in the figure.



Which part of the graph represents uniform motion of the car?

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34. An artificial satellite is moving in a circular orbit of radius 42250 km. Calculate, its speed if it takes 24 hours to revolve around the earth.

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35. Which one is scalar quantity.

A. Velocity

B. Speed

C. displacement

D. deceleration

Answer:

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36. What is the S.I. unit of speed?

A. Km/h

B. cm/s

C. m/s

D. m/h

Answer:

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37. Rate of change of displacment is known as-

A. Velocity

B. acceleration

C. speed

D. retardation

Answer:

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38. If the distance travelled by a body is x and its displacement is y, which one is not correct?

A. x>y

B. x-y=0

C. x < y

D. $x \neq y$

Answer:

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39. Which one is a vector quantity?

A. area

B. volume

C. acceleration

D. speed

Answer:

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40. Which has no direction-

A. Velocity

B. displacement

C. acceleration

D. distance

Answer:

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41. What is the unit of acceleration-

A. cm / s^2

B. km/min

C. m/s

D. S

Answer:

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42. Retardation

A. increases in velocity

B. decrease in velocity

C. velocity remain same

D. magnitude of velocity remains same but direction is changed.

Answer:

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43. Express 12.5 m/s into km/h ?

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44. If a body travels 30 m in 3 see the speed of the body is

A. 10 m/s

B. 10 cm/s

C. 30

D. 27 m

Answer:

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45. Which relation is not correct-

A. $Speed = \frac{dis\tan ce}{time}$

B. Distance =velocity x time

C. acceleration = velocity / time

D. velocity = acceleration / time

Answer:

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46. What is distance?

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47. Is distance a vector quantity?

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48. What is displacement?

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49. Is displacement a vector quantity?

Watch Video Solution

50. What it he C.G.S and S.I. unit of displacement?

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51. What is a scalar quantity? Give two examples.

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52. What is vector quantity? Give two examples.

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53. Under which condtion the distance travelled by a body is equal to the displacement of the body?

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54. When the displacement of a moving body becomes zero?

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55. What is speed?

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56. Is speed a scalar quantity?

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57. Write down the relation between speed, distance travelled by the body and time taken.

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58. What is the C.G.S and S.I unit of speed?

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59. What is uniform speed?

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60. What is nonuniform speed?

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61. What is velocity?

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62. Define velocity in terms of displacement.

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63. Is velocity a vector quantity?

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64. Write the expression for average velocity?

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65. What is the C.G.S and S.I unit of velocity?

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66. What is uniform velocity?

Watch Video Solution

67. What is non unifrom velocity?

Watch Video Solution

68. What is acceleration?

Watch Video Solution

69. Is acceleration a scalar quantity?

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70. What is the C.G.S and S.I. unit of acceleration?

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71. A body moves from A to B. The velocity of the body at A is u and at B is V. Time taken by the body to move is t: Write down the expression for acceleration 'a' of the body.

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72. What is uniform acceleration?

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73. What is non unifrom acceleration?

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74. Give two examples of unifrom acceleration?

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75. What is the direction of acceleration?

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76. What is retardation?

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77. Give one example of retardation.

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78. What is uniform circular motion?

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79. Give two examples of uniform circular motion.

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80. The states of rest and motion are relative? Explain it.

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81. Write difference between distance and displacement.

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82. Write the difference between speed and velocity.

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83. How can the velocity of a body be changed?

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84. Uniform circular motion is accelerated motion explain.

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85. A stone tied to one end of a string is rotated in a Circle. What happens when the stone is released?

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86. Find the relation $v = u + at$, where, u-initial velocity, v-final velocity, a-acceleration and t-time.

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87. Find the relation $s = ut + \frac{1}{2}at^2$

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88. Find the relation $v^2 = u^2 + 2as$

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89. An object is moving along a straight line with a uniform speed of 10m/s. Plot a graph showing distance versus time from t=0 to t=10s.

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90. The following is a time -distance table of a body moving with non-uniform speed. Prepare a graph.

Time (in seconds)	0	1	2	3	4
Distance (in metres)	0	3	7	12	18

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91. Draw the shape of the velocity-times graph for a body moving with (a) uniform velocity, (b) uniform acceleration.

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92. A body moving in a circular path of radius 14 m completes one round in 10 seconds. Find its circular velocity.

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93. The circular velocity of a moving body is 13.2 m/s. It takes 10 seconds to make one complete circle. Find out the radius of the circular path.

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94. A motor car travelled 100 km at a velocity of 40 km/h and come back with a velocity of 25 km/h. Find the average speed.

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95. A motor car starting from rest travelled for 10 seconds with an uniform. acceleration of $5m/s^2$. What is the final velocity? Find the distance covered by the car.

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96. A cricket ball is vertically thrown up with a velocity 20 m/s. If the acceleration' - in the

opposite direction is $10m/s^2$, how high will the ball rise? What time will it take to reach the maximum height?

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97. A train is moving at a velocity of 120 km/h. Brakes were applied and an uniform retardation of $0.5m/s^2$ was produced. What distance will the train move before coming to a half?

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98. The initial velocity of a car is 3 m/sec. Its after 1 sec. velocity changed to 4 m/sec. If the car moves with uniform acceleration, what will be its velocity after 10 secs?

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99. A bullet weighing 10 g is fired with a velocity of 800ms −1 . After passing through a mud wall 1 m thick, its velocity decreases to

100ms −1 . Find the average resistance offered by the mud wall.

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100. A bullet with a speed of $3x10^3 cm/s$ strikes a wooden target and penetrates a distance of 1.5 cm. Find (i) the acceleration (ii) the time.

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101. A car is moving at a velocity 72 km/h. Brakes were applied. After moving a distance 200 m the car attains velocity 36 km/h. Find (i) acceleration of the car

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102. A car is moving at a velocity 72 km/h. Brakes were applied. After moving a distance 200 m the car attains velocity 36 km/h.What

distance will the train move before coming to rest.

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