



PHYSICS

BOOKS - MODERN PUBLICATION

MOTION

Exercise

1. You are moving towards Qutab Minar. Is Qutab Minar at rest or in motion with respect to you?



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2. Two trains A and B are moving on parallel tracks with same speed and in the same direction. An observer P is sitting in train A and another person Q is sitting in train B. Is Q at rest with respect to P?



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3. Motion is an absolute term.





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4. Rest is a relative term.



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5. Can an object be at rest as well as in motion at the same time ?



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6. Define rest and motion. Give one example for each.



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7. Define rest and motion. Give one example for each.



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8. Have you ever experienced that the train in which you are sitting appears to move while it is actually at rest ? Discuss.



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9. An athlete completes 100m race on a straight track. Calculate the distance and magnitude of displacement of athlete during the race.



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10. A circular track is made on which an athlete has to cover three rounds to complete a 1000 m run. During the run find the distance and magnitude of displacement of the athlete.



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11. On a square track of edge length 100 m, an athlete starts from one corner and reaches diagonally opposite corner. Find the distance

and the magnitude of displacement of the athlete.



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12. If the athlete reaches back to the same corner after running on the track once, find the magnitude of displacement of the athlete.



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13. A cricket ball is thrown up. It reaches a height 10 m from the point of throw and then reach back to the point of throw. Find the distance and displacement of the ball.



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14. What is the difference between distance and displacement?



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15. Give one example where distance is not equal the magnitude of displacement.



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16. Differentiate between speed and velocity.



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17. Give three examples in which average speed is not equal to the magnitude of average

velocity.



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18. Define uniform motion.



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19. Define acceleration .What are positive and negative accelerations?



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20. A car is moving with a speed of 30 m/s .

Find the distance covered by the car in 2s



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21. A car is moving with a speed of 30 m/s . Find

the distance covered by the car in 1 minute .



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22. An artificial satellite orbits in a circular path. The height of the satellite from the surface of earth is 36,000 km. Such satellite is called geo - stationary. When the satellite is exactly vertically upwards the ground station, it sends a signal. How much time will the signal take to reach the ground station. The speed of signal is $3 \times 10^8 \text{ms}^{-1}$



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23. A body travels a distance s_1 with velocity v_1 and distance s_2 with velocity v_2 in the with velocity v_2 . Calculate the average velocity.



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24. A boy goes to market at an average speed of 29 kmh^{-1} . finding the market closed he return back by same path with an average speed of 40 kmh^{-1} . find the average speed and velocity for complete journey.





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25. A boy goes to the market at an average speed of 29 km/h. finding the market closed, he immediately returns back by the same path with an average speed of 40 km/h, if the boy covers half the path during his return journey. Find the average speed and average velocity.



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26. An object travels 16 m in 4 s and then another 16 m in 2s. What is the average speed of the object?



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27. The odometer of a car reads 2000 km at the start of a trip and 2400 km at the end of the trip . If the trip took 8 h , calculate the average speed of the car in km/h and m/s.



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28. Usha swims in a 90 m long pool. She covers 180 m in one minute by swimming from one end to the other and back along the same length path. Find the average speed and average velocity of Usha.



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29. Starting from a stationary position , Rahul paddles his bicycle to attain a velocity of 6 m/s in 30 s. Then he applies brakes such that the

velocity of bicycle comes down to 4m/s in the next 5s . Calculate the acceleration of the bicycle in both the cases.



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30. Priyanka takes 30 minutes to cover a distance 3 kilometres on a bicycle. Calculate her velocity units of kilometre/min, m/s , and km/h .



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31. A car travels 40 km in 30 minutes and the next 40km in 40 minutes. Calculate the average speed for entire journey.



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32. A car travels 30 km at a uniform speed of 40 km/h and the next 30 km at a uniform speed of 20 km/h . Find its average speed.



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33. A train 120 m long moving on a straight and track with uniform speed passes a pole in 6 seconds Find: the speed of the train.



Watch Video Solution

34. A train 120 m long moving on a straight and track with uniform speed passes a pole in 6 seconds Find: the speed of the train.



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35. If a body covers first half of its journey with uniform speed v_1 and the second half of the journey with uniform speed v_2 . Then the average speed during whole journey.



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36. A car traelling at $20kmh^{-1}$ speeds up $60kmh^{-1}$ in 6 sec. What is its acceleration?



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37. A 100 m long train crosses a bridge of length 200m in 50 seconds with constant velocity. Find the velocity.



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38. What does slope of (v-t) graph represent?



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39. What does the area under $v-t$ graph indicate?



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40. What are the uses of graphs?



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41. What does the slope of $d-t$ graph indicate?

Here d stands for distance.



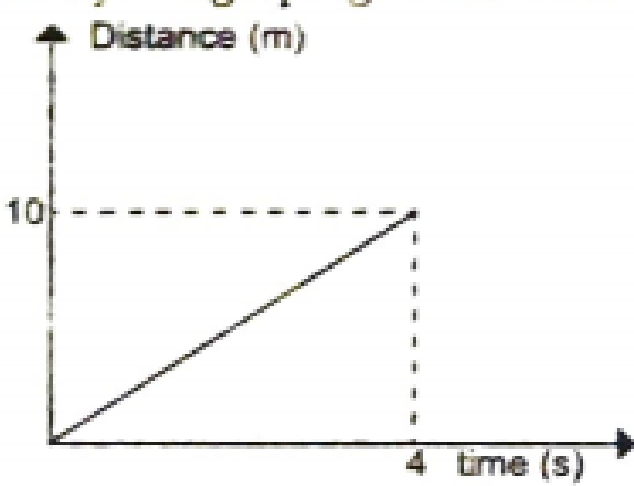
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42. Velocity-time graph of a body is parallel to time axis. What is the acceleration of the body?



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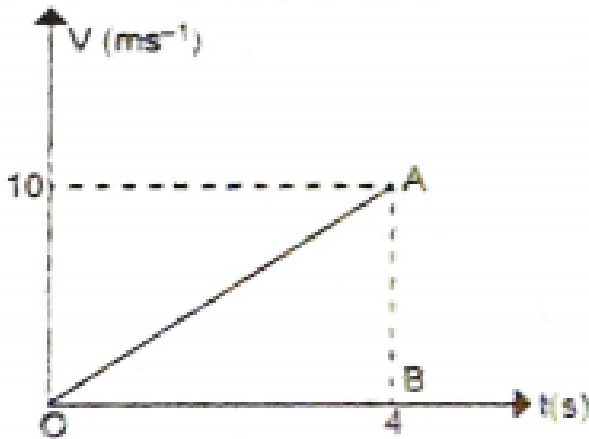
43. Find the speed of the body whose motion is depicted by the graph given below.



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44. Find the acceleration of the body whose motion is depicted by the graph? Also find the

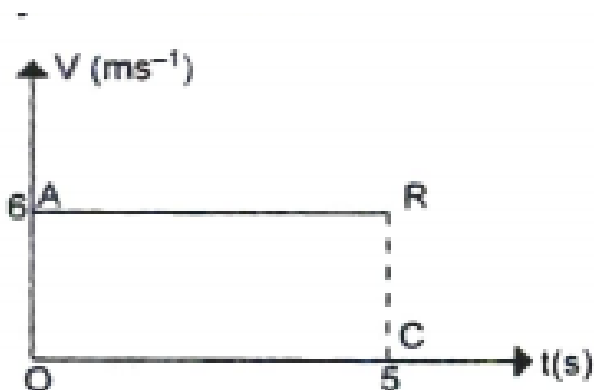
distance covered in 4 seconds?



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45. Depict the motion of a body whose speed-time graph is given. Also find the distance

covered the body in 5 seconds.



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46. Represent the following data graphically.

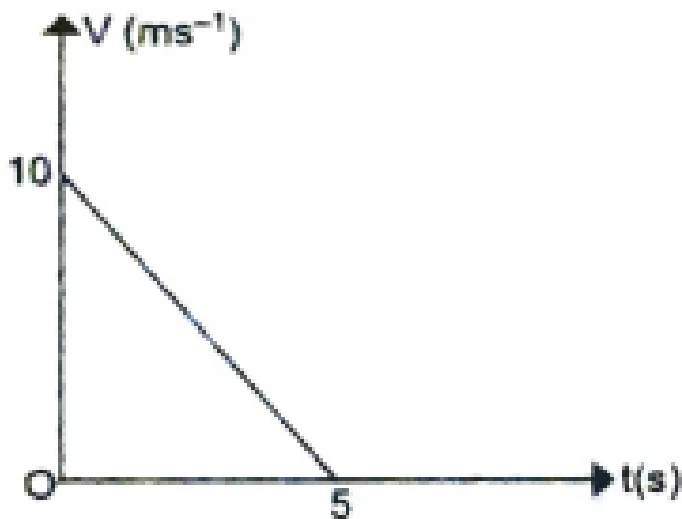
Interpret the motion of body.

time(s)	0	2	4	6
distance (m)	0	5	10	20



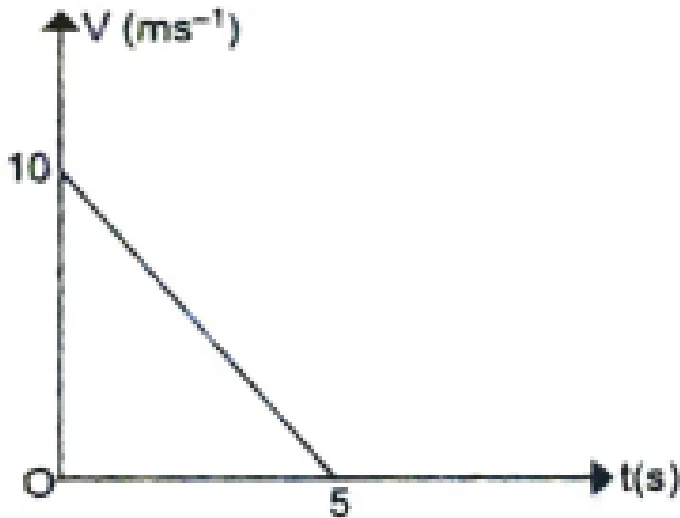
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47. Interpret the given graph. Also find the acceleration.



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48. Interpret the given graph. Also find the distance covered.



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49. Derive third equation of motion by graphical method.



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50. A train starting from rest attains a velocity of 72 km/h in 5 minutes. Assuming that the acceleration is uniform Find the acceleration.



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51. A train starting from rest attains a velocity of 72 km/h in 5 minutes. Assuming that the acceleration is uniform Find the distance

travelled by the train for attaining this velocity.



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52. A car accelerates uniformly from $18\text{km} / \text{h}$ to $30\text{km} / \text{h}$ in 5s . Calculate the acceleration.



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53. A car accelerates uniformly from 18 km/h to 30 km/h in 5s . Calculate the distance covered

by the car in that time.



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54. The brakes applied to a car produce an acceleration of $6ms^{-2}$ in the opposite direction to the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance traveled during this time.



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55. A car moving along a straight line at a speed of 72km/h stops in 5s . After the brakes are applied. Find the acceleration



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56. A car moving along a straight line at a speed of 72km/h stops in 5s . After the brakes are applied. Plot the graph of speed versus time



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57. A car moving along a straight line at a speed of 72km/h stops in 5s . After the brakes are applied. Using the graph find the distance covered by the car after the brakes are applied.



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58. An object is dropped from a height of 120 m . The acceleration of the object is 10m/s^2 downwards. Find the distance travelled by the

object after 1s. What is the final velocity of the object after 3s?



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59. An object is dropped from a height of 120 m. The acceleration of the object is 10m/s^2 downwards. Find the distance travelled by the object after 2s. What is the final velocity of the object after 3s?



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60. An object is dropped from a height of 120 m. The acceleration of the object is 10m/s^2 downwards. Find the distance travelled by the object after 3s. What is the final velocity of the object after 3s?



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61. An object is moving with a velocity of 5m/s and with a deacceleration of 1m/s^2 . What will be the distance travelled by the car before coming to rest?



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62. An object is moving with a velocity of $5m/s$ and with a deacceleration of $1m/s^2$. What will be the time taken for coming to rest?



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63. A body is moving with a velocity of $10 m/s$. If the motion is uniform, what will be the

velocity after 10s?



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64. If a car accelerates uniformly from rest and attains a speed of 40ms^{-1} in 10s, it covers a distance of

A. 200 m

B. 300 m

C. 356 m

D. 142 m

Answer:



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65. The unit of a acceleration is

A. m/s

B. m/min

C. km/hr

D. km / min^2

Answer:



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66. A train passes over a 200 m long bridge in 10s. The length of the train is 100 m. The speed of the train is

A. 10 m/s

B. 30 m/s

C. 0.86 m/s

D. 1.42 m/s

Answer:



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67. A particle covers equal distance in equal intervals of time. It is said to be

- A. at rest
- B. moving with constant speed
- C. moving with constant acceleration
- D. moving with constant velocity

Answer:



68. If a bus accelerates uniformly from rest to speed of 144kmkh^{-1} in 20s, it covers a distance

A. 200 m

B. 400 m

C. 600 m

D. 800 m

Answer:



69. A train travels at a speed of 50 km 30 minutes 40kmh^{-1} for the next 15 minutes then 60kmh^{-1} for the next 60 minutes. Calculate the average speed of the car

A. 26.12kmh^{-1}

B. 34.59kmh^{-1}

C. 43.95kmh^{-1}

D. 54.29kmh^{-1}

Answer:



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70. If a body starts from a point and returns back to the same point, then its

A. average speed is zero, but average velocity is not zero

B. both average speed and average velocity is zero

C. average speed and velocity depends upon the path

D. average velocity is zero, but not the average speed.

Answer:



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71. An open car is moving with uniform velocity. A person sits in the car and projects a ball vertically upwards. The ball

- A. falls back in his hand
- B. Falls outside the car
- C. Falls by the side of car
- D. falls in front of the car

Answer:



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72. A 130 m long train is moving in a direction with speed 20ms^{-1} . Another train moving

with 30ms^{-1} and 120 m long crosses the first train in a time

A. 6s

B. 36s

C. 38s

D. none

Answer:



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73. A stone is thrown vertically upwards by a boy. It returns to his hands in 3 seconds. How high does the stone rise?

A. 11 m

B. 12 m

C. 3 m

D. 44 m

Answer:



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74. Which of the following is a vector?

A. Work

B. Speed

C. Acceleration

D. Mass

Answer:



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75. A body is travelling at a constant speed in a circle. It has

- A. constant velocity
- B. it is not accelerated
- C. an inward radial acceleration
- D. an outward radial acceleration.

Answer:



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76. The angular velocity of earth's rotations on its geographical axis is

A. $\frac{\pi}{6}$ rad/hour

B. $\frac{\pi}{12}$ rad/hour

C. $\frac{\pi}{24}$ rad/hour

D. 15 rad/hour

Answer:



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77. A particle of mass m is executing uniform circular motion on a path of radius r . If p is the magnitude of its linear momentum, then the radial force acting on the particle is



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78. Define rest.



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79. Define Motion. Why are these terms called relative? Give an example of each.



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80. Are rest and motion absolute terms?



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81. Why are rest and motion relative terms?



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82. Define distance.



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83. Is distance a scalar quantity?



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84. What is the SI unit of distance?



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85. Define displacement.



Watch Video Solution

86. What is the SI unit of displacement?



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87. Is displacement a scalar quantity ? Why?



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88. Can distance travelled by a moving body be zero?



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89. Can displacement of a body be zero?



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90. Can overall energy of a body be negative?



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91. Define speed.



[Watch Video Solution](#)

92. What is the SI unit of speed ?



[Watch Video Solution](#)

93. Is speed a vector quantity?



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94. What is the relationship between kmh^{-1} and ms^{-1} ?



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95. What does the speedometer of a vehicle measure?



[Watch Video Solution](#)

96. Define velocity.



Watch Video Solution

97. What is the SI unit of velocity?



Watch Video Solution

98. Define acceleration .What are positive and negative accelerations?



Watch Video Solution

99. What is the SI unit of acceleration ?



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100. What do we mean by saying that the acceleration of body is $3ms^{-2}$?



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101. When do we say that a body is retarding or decelerating?



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102. What is the difference between average speed and instantaneous speed?



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103. Can average speed and instantaneous speed be equal? Explain.



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104. Define uniform motion.



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105. Can a body be accelerated, if it is moving with constant speed?



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106. If a body cover a distance x with speed v_1 and then it covers another distance x with speed v_2 , find the average speed for the whole journey.



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107. If a body covers a three equal distances with speeds v_1 , v_2 and v_3 then what is the

average speed of the body?



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108. If a body travels for time 't' with speed v_1 and then it further travels for time 't' with speed v_2 find the average speed.



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109. If a body covers a three equal distances with speeds v_1 , v_2 and v_3 then what is the

average speed of the body?



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110. Convert $5\text{m}/\text{min}$ in ms^{-1}



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111. Convert $5\text{m}/\text{min}$ in kmh^{-1}



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112. Discuss whether the walls of your classroom are at rest or motion.



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113. Have you ever experienced that the train in which you are sitting appears to move while it is actually at rest ? Discuss.



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114. Measure the time it takes you to walk from house to school. If you consider that your walking speed is 3kmh^{-1} . Find the distance between house and school.



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115. A cyclist travels a distance of 4 km from P to Q then moves a distance of 3 km at right angles. Find his resultant displacement graphically.



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116. A particle moves 3 m north, then 4m, east and then 6m south. Calculate the displacement.



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117. An athlete completes one round of a circular travel diameter 49 m in 20s. Calculate the distance correct and displacement at the end of 30s.



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118. What are enantiomers ? Give an example.



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119. In case of a moving body can distance travelling less than displacement?



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120. Give some points of differences between distance and displacement.



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121. $\frac{\textit{Speed}}{|\textit{velocity}|} \geq 1$. Interpret.



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122. Differentiate between speed and velocity.



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123. At a time when it is cloudy, there may be frequent thunder and lightning. The sound of thunder takes some time to reach you after you see the lightning. Can you answer why this happens? Measure this time interval using a stop watch. Calculate the distance of the nearest point of lightning (speed of sound in air = 346 ms^{-1})`



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124. Given an example of each acceleration is in the direction of motion.



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125. Given an example of each acceleration is against the direction of motion.



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126. Given an example of each acceleration is uniform.



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127. Given an example of each acceleration is non-uniform.



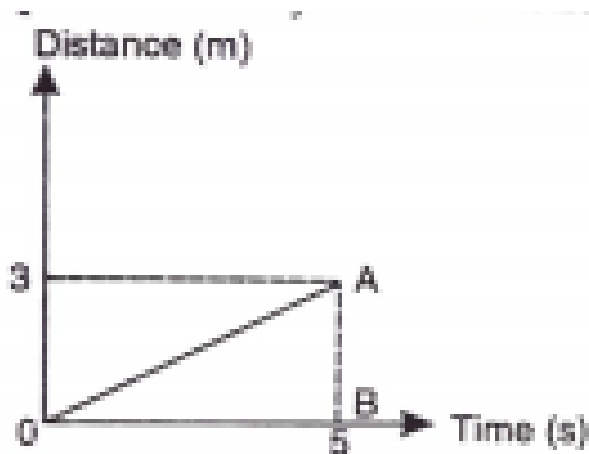
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128. Draw a position time graph of a body at rest at 5 m from the origin.



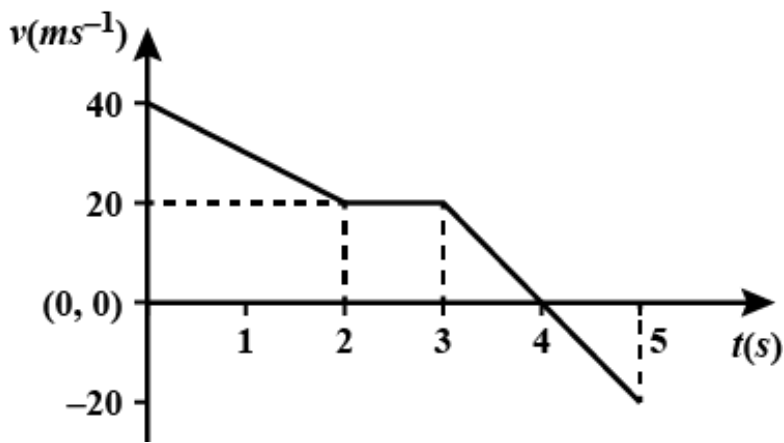
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129. Find the speed of the body from the following graph.



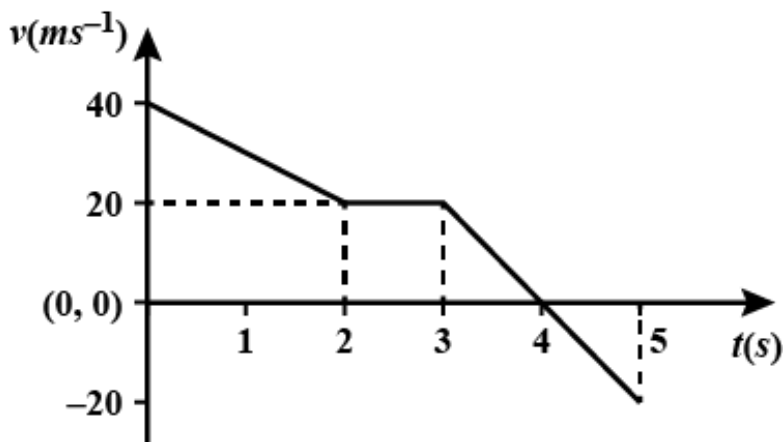
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130. In the graph, what is the distance covered by the body in 5 sec?



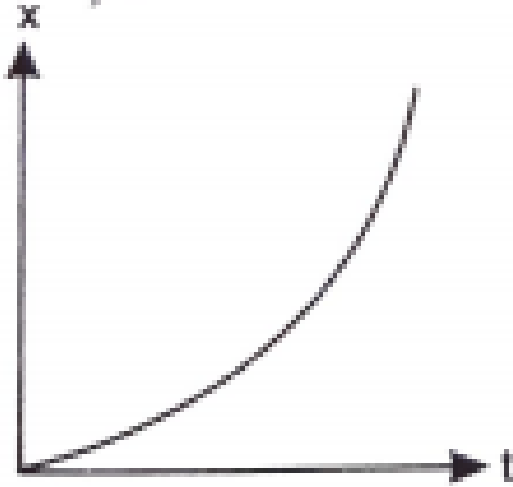
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131. In the graph , what is the distance covered by the body in 2.5 sec



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132. What is the following graph depicting about the motion of an object?



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133. How can you get the distance travelled by an object from its speed-time graph? Explain.



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134. How can the distance travelled by an object be calculated from the velocity - time graph?



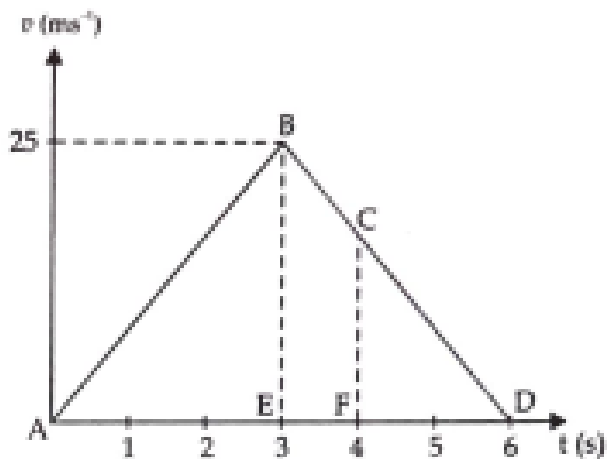
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135. How do you get the displacement of a particle in a time interval t_1 to t_2 from its velocity-time graph? Explain with an example.



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136. Study the velocity-time graph and calculate:



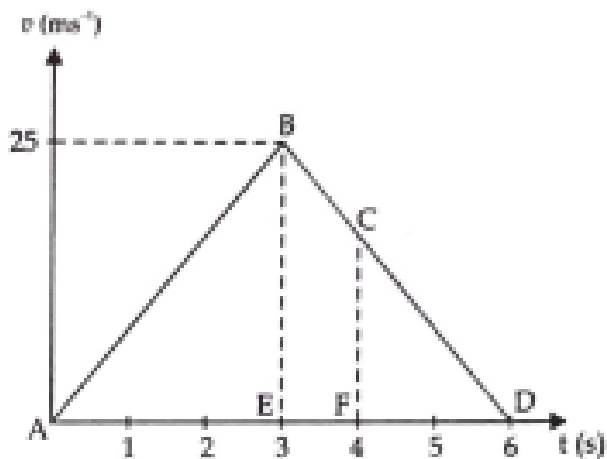
The

acceleration from A to B



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137. Study the velocity-time graph and calculate:



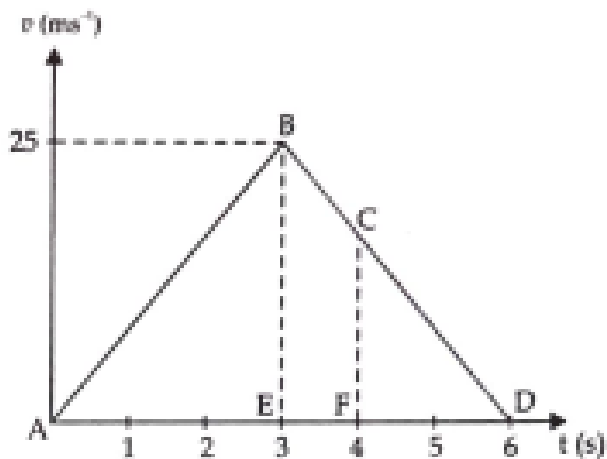
The

acceleration from A to B.



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138. Study the velocity-time graph and calculate:



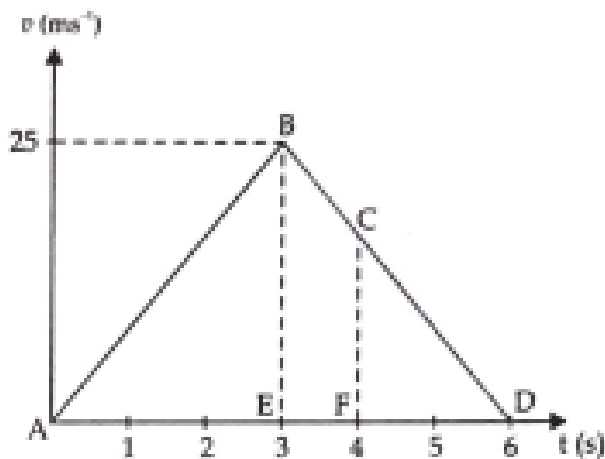
The

distance covered in region ABE.



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139. Study the velocity-time graph and calculate:



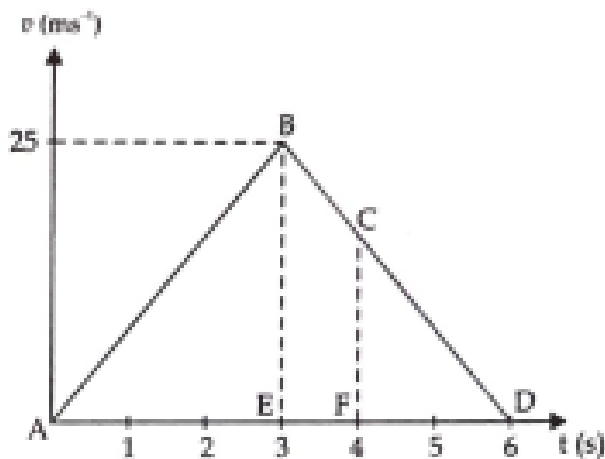
The

average velocity from C to D.



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140. Study the velocity-time graph and calculate:



The

distance covered in region BCFE



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141. What do you mean by $5ms^{-2}$?



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142. Define acceleration.



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143. A body starts from rest. What can be interpreted by this statement?



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144. A body ultimately stops. What can be interpreted by this statement?



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145. Can we use equations of motion for motion having variable acceleration?



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146. Give example of a motion in which speed of a body constant but the body is in accelerated motion.



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147. Equations of motions can be used if acceleration depends on time Comment.



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148. For distance $\propto (\text{time})^2$ we can use equations of motion. Comment.



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149. For distance $\propto (\text{time})^3$ we can use equations of motion. Comment.



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150. What do you mean by ions ?



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151. If a spoon is dropped from an artificial satellite orbiting around the earth, will it reach the surface of earth? If not, then explain why.



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152. Explain that a uniform circular motion is an accelerated motion.





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153. Name a physical quantity which varies.

A. velocity

B. distance

C. speed

D. temperature

Answer:



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154. Name a physical quantity which remains constant when a body moves in a uniform circular motion.



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155. Write equations of motion for a body starting from rest and moving with constant acceleration.



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156. A body is projected in vertically upwards direction with a speed u . Find the time taken



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157. A body is projected in vertically upwards direction with a speed u . Find the distance travelled by the body in reaching its topmost point.



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158. Derive second equation of motion by a method other than graphical method.



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159. Identify the kind of motion in the following cases: A car moving with constant speed turning around a curve.



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160. Identify the kind of motion in the following cases: An electron orbiting around a nucleus.



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161. 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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162. Derive second equation of motion by a method other than graphical method.



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163. Derive third equation of motion by graphical method.



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164. Derive third equation of motion by graphical method.



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165. A particle is moving in a circular path of radius r . The displacement after half a circle would be

A. zero

B. πr

C. $2r$

D. $2\pi r$

Answer:



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166. A body is thrown vertically upward with velocity u , the greatest height h to which it will rise is

A. u/g

B. $u^2 / 2g$

C. u^2 / g

D. $u/2g$

Answer:



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167. The ratio of displacement to distance is :

A. always less than 1

B. always equal to 1

C. always more than 1

D. equal or less than 1

Answer:



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168. If the displacement of an object is proportional to square of time, then the object moves with

A. uniform velocity

B. uniform acceleration

C. increasing acceleration

D. decreasing acceleration

Answer:



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169. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of $10ms^{-1}$. It implies that the boy is

A. at rest

B. moving with no acceleration

C. in accelerated motion

D. moving with uniform velocity

Answer:



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170. Area under a v - t graph represents a physical quantity which has the unit

A. m^2

B. m

C. m^3

D. ms^{-1}

Answer:



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171. Slope of a velocity-time graph gives

A. the distance

B. the displacement

C. the acceleration

D. the speed

Answer:



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172. In which of the following cases of an the distance moved and the magnitude displacement are equal?

A. If the car is moving on straight road

B. If the car is moving in circular path

C. The pendulum is moving to and fro

D. The earth is revolving around the sun

Answer:



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173. A car starts from rest and moves with uniform acceleration a on a straight road from time $t=0$ to $t=T$. After that, a constant

deceleration brings it to rest. In this process the average speed of the car is

A. αt

B. βt

C. $aT/2$

D. $\left(\frac{\alpha\beta}{\alpha + \beta} \right)$

Answer:



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174. A body falling from rest describes distances S_1 , S_2 and S_3 in the 1st, 2nd and 3rd seconds of its fall. Then the ratio of $S_1 : S_2 : S_3$ is

A. 1:1:1

B. 1:3:5

C. 1:2:3

D. 1:4:9

Answer:



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175. A person takes time t to go once around a circular path of diameter $2R$. The speed (v) of this person would be

A. $\frac{t}{2\pi R}$

B. $\frac{2\pi R}{t}$

C. $\frac{\pi R^2}{t}$

D. $2\pi Rt$

Answer:





176. A man walks along the footpath of a circular garden. During his motion along the circular path he makes several rounds. His net displacement will be zero whenever his distance traveled is multiples of

- A. its radius
- B. its diameter
- C. circumference of circular path
- D. area of circle

Answer:



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177. Which of the following situation is not possible?

A. An object moving in certain direction with an acceleration in perpendicular direction

B. An object moving with constant acceleration but zero velocity.

C. An object moving with variable speed and uniform velocity.

D. None of the above

Answer:



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178. A ball thrown up vertically returns to the thrower after 6 s. Find its position after 4 s.

A. 2.5s

B. 3s

C. 4s

D. 5s

Answer:



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179. A particle starts its motion from rest under the of a constant force. If the distance covered in is S_1 and that covered in first $20s$ is S_2 then

A. $S_2 = s_1$

B. $S_2 = 2S_1$

C. $S_2 = 3S_1$

D. $S_2 = 4S_1$

Answer:



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180. The initial odometer reading of a cab is 369 km. It travelled for 2 hrs and final reading is 469 km. find out the avg speed of the cab.

A. $14ms^{-1}$

B. $11ms^{-1}$

C. $8ms^{-1}$

D. $17ms^{-1}$

Answer:



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181. Observe the given distance-time graph. Identify the respective speeds of the body it moves from O to A and B to C

A. 2kmh^{-1} , 4kmh^{-1}

B. 1kmh^{-1} , 3kmh^{-1}

C. 3kmh^{-1} , 5kmh^{-1}

D. 4kmh^{-1} , 6kmh^{-1}

Answer:



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182. Identify the vector quantity among the following:

A. speed

B. velocity

C. weight

D. linear momentum

Answer:



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183. Which of the following is an example of uniform circular motion?

A. The movement of a seconds hand of a

B. The movement of a car on highway cu

C. The movement of clothes in a dryer
washing machine

D. The movement of passenger cabin on a
wheel.

Answer:



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184. A body is thrown vertically upwards. At the upmost point of its motion its acceleration is

- A. zero
- B. g upwards
- C. g downwards
- D. none of the above

Answer:



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185. Identity which of the statements given below are applicable for an object to move in a circle.

- A. Object must continually slow down
- B. Object must accelerate
- C. Object must be acted on by balanced forces

D. Object must move with uniform velocity.

Answer:



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186. When will a body have zero speed?

A. When the body is always under rest

B. When the body has non-uniform
acceleration

C. When the body has uniform velocity

D. When the body is always under motion

Answer:



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187. A ball dropped from a height 'h' reaches the ground in time 'T'. What is its height from the ground at time $\frac{T}{2}$?

A. $\frac{h}{28}$

B. $\frac{h}{4}$

C. $\frac{h}{2}$

D. $\frac{3h}{4}$

Answer:



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188. An insect moves along the sides of a wall of dimensions $12m \times 5m$ starting from one corner and reaches the diagonally opposite corner. If the insect takes 2s for its motion

then find the ratio of average speed to average velocity of the insect.

A. 17:13

B. 12:5

C. 13:5

D. 17:12

Answer:



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189. The distance travelled by a body in the n th second is given by the expression $(4 + 6n)$. Find the initial velocity and acceleration.

A. $3ms^{-1}$, $6ms^{-2}$

B. $7ms^{-1}$, $4ms^{-2}$

C. $7ms^{-1}$, $6ms^{-2}$

D. $7ms^{-1}$, $4ms^2$

Answer:



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190. A body loses half of its velocity while penetrating 3 cm into a wooden block, then how much will it penetrate before coming to rest?

A. 1 cm

B. 2 cm

C. 3 cm

D. 4 cm

Answer:



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191. Which of the following example shows, an object does not change its magnitude of velocity but only its direction of motion?

- A. Parachutist bailing out of an aeroplane
- B. Motion of a body along a circular path
- C. A body moving up against gravity
- D. A car moving with uniform velocity in a straight line

Answer:



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192. A ball is released from the top of a tower of height h metre. It takes T second to reach the ground. What is the position of the ball in $T/3$ second?

A. $h/9$ metres from ground

B. $7h/9m$ from ground

C. $8h/9$ m from ground

D. $4h/9$ m from ground

Answer: $17h/18$ m from ground



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193. Which of the following statements is not true for a particle moving in a circle with a constant angular speed?

A. The velocity vector is tangent to the circle

B. The acceleration vector is tangent to the circle

C. The acceleration vector points to the centre of the circle.

D. The velocity and acceleration vectors are perpendicular to each other

Answer:



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194. A parachutist after bailing out falls 50 m without friction. When parachute opens, he descends at 2 m/s and reaches the ground with a speed of 3 m/s. At what height did he bail out?

A. 293 m

B. 111 m

C. 91 m

D. 182 m

Answer:



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195. In a 100 m race between Ramesh and Suresh, Ramesh wins the race. Assuming they run uniform acceleration. Which of the following correct?

A. Acceleration of Suresh is more than Ramesh

B. Acceleration of Ramesh is more than Suresh

C. Both Suresh and Ramesh have a
acceleration

D. Both Suresh and Ramesh have equal
award velocities

Answer:



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196. If the acceleration of the particle is constant in magnitude but ot in direction, what type of path does the particle follow?

A. Straight line

B. Circular path

C. Elliptical path

D. Parabolic path

Answer:



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197. While testing the safety of a car, a dummy driver is used and the car is propelled at different speeds to hit a rigid wall. In one such

test, the dummy driver had a mass of 70 kg and the speed of the car just before impact was 40ms^{-1} . If the time interval between the collision and the car coming to rest was 0.2 s, then find the deceleration of the dummy driver due to impact.

A. 200ms^{-2}

B. 80ms^{-2}

C. 110ms^{-2}

D. 280ms^{-2}

Answer:



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198. Two ends of a train moving with a constant acceleration pass a certain point with velocities u and v . Show that the velocity with which the middle point of the train passes the same point is $\sqrt{u^2 + v^2} / 2$.

A. 14 kmph

B. 5 kmph

C. $5\sqrt{2}$ kmph

D. 10 kmph

Answer:



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199. For a moving particle, what does 'decrease in displacement with time' mean?

A. The particle is moving towards its initial position.

B. The acceleration of the particles is approaching zero

C. The particle is moving with uniform speed

D. The particle is moving with uniform motion.

Answer:



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200. A particle is moving along a circular track of radius 1m with uniform speed. What is the ratio of the distance covered and the displacement in half revolution?

A. 1 : 1

B. 0 : 1

C. π : 1

D. π : 2

Answer:



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201. Which of the following is the common characteristic of all moving bodies?

- A. They do not change their position with time
- B. They change their position with time
- C. They always travel with uniform speed.
- D. Equations of motion have to be applied to them

Answer:



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202. A body moves with constant retardation along a straight line. Which of the given physical quantities of the body decrease during its motion?

A. speed

B. Velocity

C. Displacement

D. Time

Answer:



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203. When can the magnitude of displacement be equal to the distance covered by a body?

A. When the motion of the body is towards the initial position

B. When the motion of the body is along a straight line

C. When the motion of the body is along a curved path

D. When the body moves with a uniform speed along a circular path.

Answer:



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204. Under what condition is distance and magnitude of displacement equal?



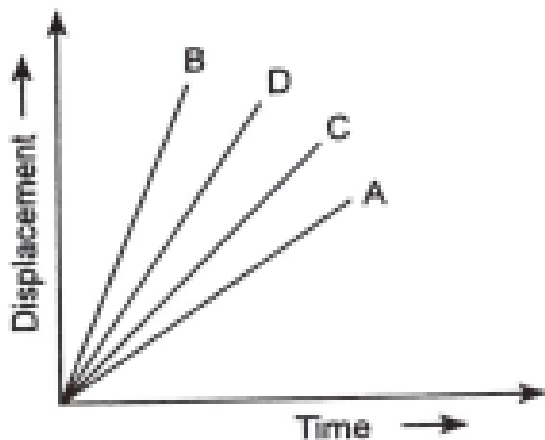
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205. What do you mean by positive and negative acceleration?



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206. Figure given shows the displacement-time graph of four children A,B,C and D. Which child has the highest velocity?



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207. Give one example each distinguishing between uniform acceleration and non-uniform acceleration.



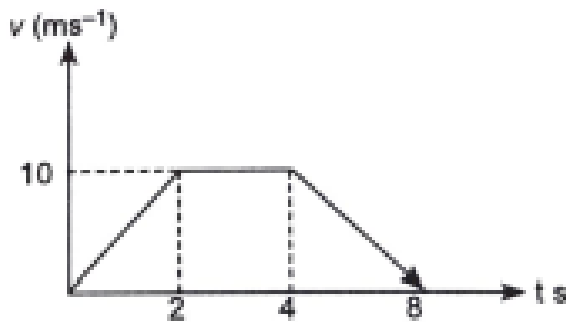
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208. A cyclist travels a distance of 4 km from A to B and then moves a distance of 3 km at right angle to AB his resultant displacement and total distance travelled.



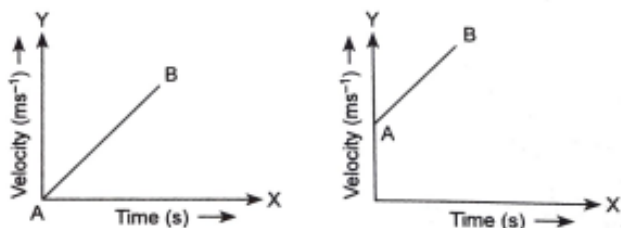
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209. Velocity of a particle moving along a straight line in a certain time interval is shown. What is distance travelled during acceleration?



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210. Explain the differences between the two graph shown in the figure



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211. A flyover is 500 m long. A 10 m long bus crosses the flyover at a speed of 30ms^{-1} . Find the time taken by to cross it.

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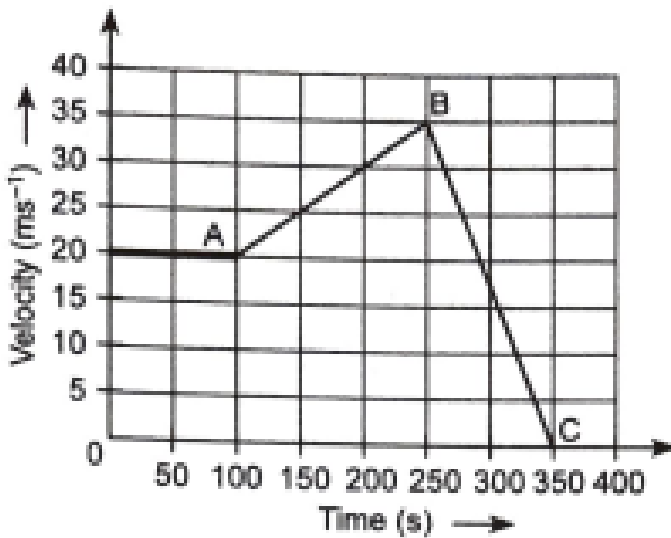
212. A cyclist goes around a circular track once every 2 minutes. If radius of the circular track is 110 m, calculate the speed of the cyclist.



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213. The velocity time graph represents motion of an object for 350s. Calculate the acceleration of the object for the time interval

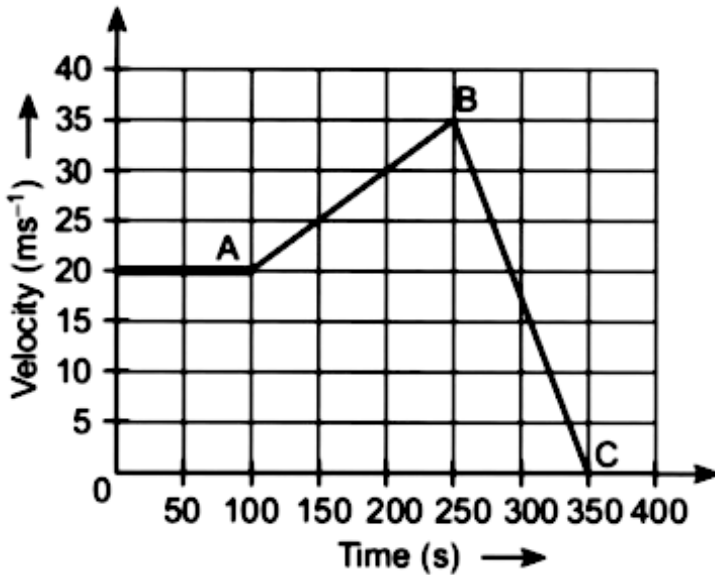
$100 \text{ sec} < t < 200 \text{ sec.}$



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214. The velocity time graph represents motion of an object for 350s. Calculate the

displacement of the object in 0 to 350 sec.



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215. The velocity time graph represents motion of an object for 350s. Which type of motion is represented by BC in the velocity-time graph?



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216. Draw velocity-time graph for a uniformly accelerated object. Using velocity-time graph derive $v = u + at$



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217. A particle is moving in a circular path of radius r . The displacement after half a circle would be

A. zero

B. πr

C. $2r$

D. $2\pi r$

Answer:



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218. The ratio of displacement to distance is :

A. always less than 1

B. always equal to 1

C. always more than 1

D. equal or less than 1

Answer:



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219. Area under a v-t graph represents a physical quantity which has the unit

A. ms^{-1}

B. m

C. m^2

D. m^3

Answer:



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Example

1. Let a car start from I (initial position) and move in a semi-circular path in clockwise

direction and reach f (Final position) which is diametrically opposite to i. Distance = πr

Displacement = $2r$



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2. A circular cycle track has a circumference of 314 m with AB as one of its diameters. A cyclist travels from A to B along the circular path with a velocity of constant magnitude 15.7 m/s. Find the distance moved by cyclist.



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3. A circular cycle track has a circumference of 314 m with AB as one of its diameters. A cyclist travels from A to B along the circular path with a velocity of constant magnitude 15.7 m/s. Find the displacement of the cyclist of AB represents north-south direction, with A towards North and B towards south.



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4. A woman travels a distance of 1 m towards north then 2m towards east and finally 3m towards south. Find the total distance



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5. A woman travels a distance of 1 m towards north then 2m towards east and finally 3m towards south. Find the displacement.



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6. Rita takes 20 minutes to cover a distance of 3.2 kilometres on a bicycle . Calculate her speed in units of kilometer/min and metre/min.



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7. A car travels 4 km in 3 minutes. Find the speed of car in $cm.s^{-1}$



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8. A car travels 20 km in 1 hour and another 40 km in 3 hour. What is the average speed of the car?



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9. A car travels the first 20km with a speed of 40kmh^{-1} and the next 40 km with a speed of 80kmh^{-1} . Find the average speed?



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10. On a 120km road, a car travels the first 30km with at a uniform speed of 30km/h. How fast must the car travel for the rest of track so as to have an average speed of 60km/h for the entire journey?



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11. A train covers half of its journey with a speed of 30 metre per second and the other half with a speed of 40 km per hour calculate

the average speed of the train during the whole journey.



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12. A train travels at a speed of 60 km/h for 0.52 h, at 30 km/h for the next 0.24 h and then at 70 km/h for the next 0.71 h. What is the average speed of the train ?



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13. A man walks at 1m/s for 60 minutes he takes rest for 20 minutes and then walks at a speed of 1m/s for 60 minutes find his average speed.



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14. A car travelling with a speed of 2ms^{-1} increases its speed to 10ms^{-1} in a time interval of 4s. What is the acceleration of car?



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15. A car travelling at a speed of 20ms^{-1} applies brakes and stops within 10s. What is the acceleration of car?



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16. The time between a clap and its echo from a wall is 0.1 s. If the distance of the wall be 17.5 m, calculate the speed of sound.



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17. If a cheetah spots his prey at a distance of 100m, what is the minimum time it will take to get its prey if the average velocity attained by it is 90 km/h?



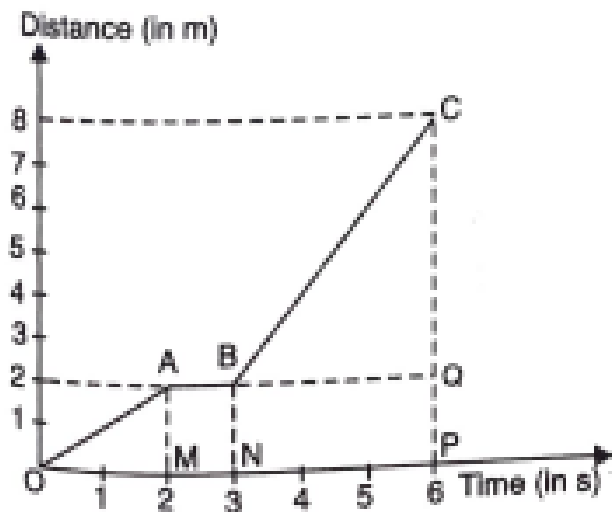
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18. Interpret the distance-time graph.



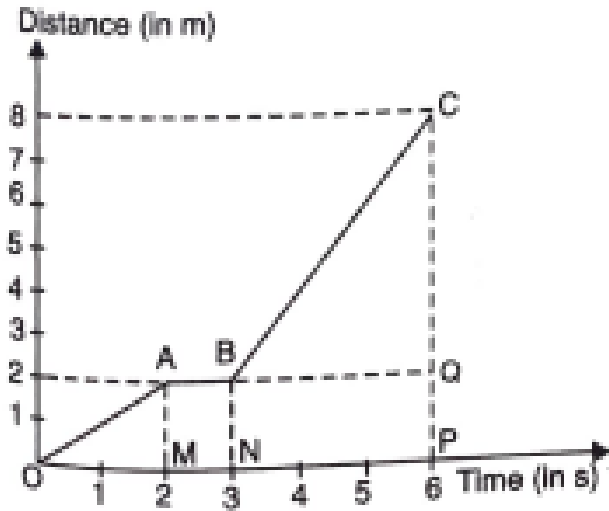
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19. From the position-time graph given find the average speed



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20. From the position-time graph given find the distance travelled between 2 sec and 5 sec.



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21. A car travelling at a speed of 10m/s stops in 4s after the application of brakes. If we assume the retardation to be constant.

Draw a speed-time graph for the above information.



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22. A car travelling at a speed of 10m/s stops in 4s after the application of brakes. If we

assume the retardation to be constant.

Find the retardation.



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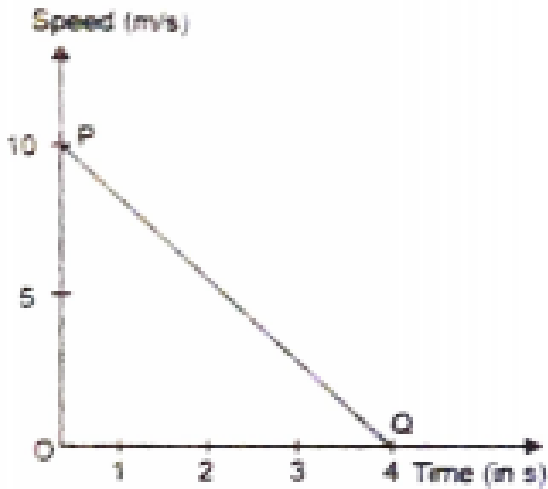
23. A car travelling at a speed of 10m/s stops in 4s after the application of brakes. If we assume the retardation to be constant.

Find the distance travelled during this time.



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24. Interpret the following graph and answer the following:

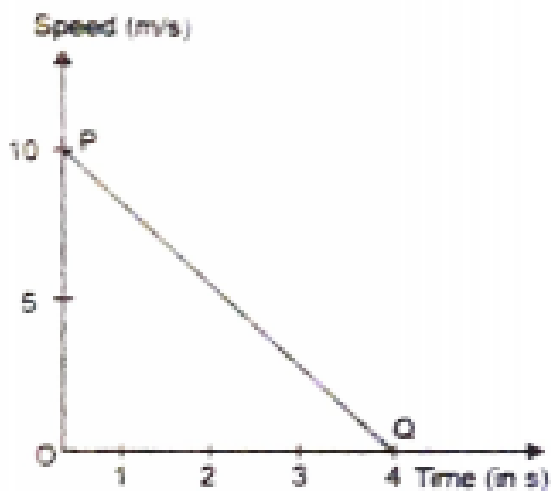


Find acceleration between A to B.



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25. Interpret the following graph and answer the following:

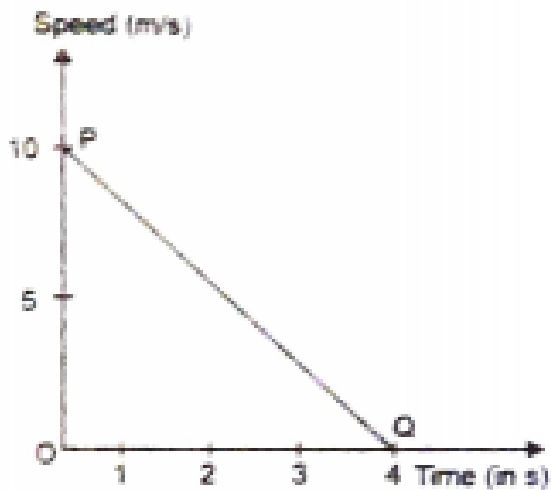


Find acceleration between B to C.



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26. Interpret the following graph and answer the following:

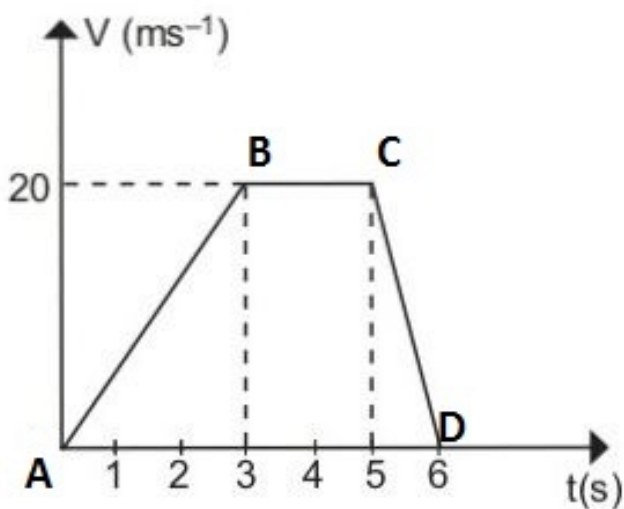


Find acceleration between P to Q.



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27. Interpret the following graph and answer the following:



The average speed for the complete journey (1 to 7s)



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28. A bus accelerates uniformly from 18 km/h to 36 km/h in 10s. Calculate the acceleration.



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29. A bus is moving with a speed of 18 kilometre per hour it comes to rest in 3 second on the application of brakes find the retardation, assuming it to be uniform.



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30. A car attains a velocity of 36kmh^{-1} after accelerating uniformly from rest in 5 seconds. Find the distance travelled.



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31. A car accelerates uniformly at the rate of 2ms^{-2} after starting from rest. Find the distance travelled and velocity attained in 4 seconds.



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32. A car is moving at a speed of 18 km . It starts retarding uniformly at 1m/s and cover to rest. Find the distance travelled.



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33. A motorcycle starts from rest. The uniformly accelerates at $1\text{m}/\text{s}^2$. Find the distance travelled in the 3rd second.



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34. A body moves on a circular path of radius 1 m. It completes one circle in 2 seconds. Find its speed.



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35. An athlete complete one round of a circular track of diameter 100 m in 15 s. What will be the distance covered and the displacement at the end of 3 minutes 30 s ?



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36. A car moves a circular path of radius 20 m in 50 s with a uniform speed. Find the speed.



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37. If two objects move in a circular path of radii in the ratio of 1:3 and take same time to complete the circle, what is the ratio of their speed?



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



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



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40. Which of the following is true of displacement? It can be zero.



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41. Which of the following is true of displacement? Its magnitude is greater than the distance travelled by the object.



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42. Distinguish between speed and velocity.



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43. Under what condition(s) is the magnitude of average velocity of an object is equal to its average speed ?



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44. What does the odometer of an automobile measure ?



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



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46. 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 a speed of light that is

$$3 \times 10^8 \text{ms}^{-1}.$$



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47. When will you say a body is in : uniform acceleration ?



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48. When will you say a body is in : non-uniform acceleration ?



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49. A bus decrease its speed from 80kmh^{-1} to 60kmh^{-1} in 5 sec. Find acceleration of the bus.



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50. A train starting from a railway station and moving with uniform acceleration attains a

speed of 40km/h in 10 minutes. Find its acceleration.



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51. What is the nature of the distance-time graphs (x - y) for uniform and non uniform motion of an object ?



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



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



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



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55. A bus starting from rest moves with a uniform acceleration of $0.1ms^{-2}$ for two minutes. Find: the speed acquired.



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56. A bus starting from rest moves with a uniform acceleration of $0.1ms^{-2}$ for two minutes. The distance travelled.



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57. A train is travelling at a speed of $90kmh^{-1}$. Brakes are applied so as to produce a uniform acceleration of $-0.5ms^{-2}$. Find how far the train will move before it is brought to rest?



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



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



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60. A stone is thrown in a vertically upward direction with a velocity of 5ms^{-1} if 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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61. An athlete completes one round of a circular track of diameter 200m in 40s. What

will be the distance covered and the displacement at the end of 2 min 20s?



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62. Joseph jogs from one end A to the 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 speeds and velocities in jogging (a) from A to B and (b) from a to C ?



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63. Joseph jogs from one end A to the 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 speeds and velocities in jogging (a) from A to B and (b) from A to C ?



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64. Abdul while driving to school, computes the average speed for his trip to be 20 km h^{-1}

. On this trip along the same route there is less traffic and average speed is 40 km h^{-1} .

What is the average speed for Abdul's trip ?



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



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66. A driver of a car travelling at 52kmh^{-1} applies the brake and accelerates uniformly in opposite direction. The car stop in 5 s. Another driver going at 3 km h^{-1} applied his brakes slowly and stop in 10 s. On the same graph paper plot the speed versus time graph for the two cars. Which of the two cars travelled farther after the brakes were applied ?



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67. 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 it will strike the ground ? After What time will it strike the ground ?



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68. State which of the following situations are possible and give an example for each of

these an object with a constant acceleration but with zero velocity.



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69. State which of the following situations are possible and give an example for each of these an object moving in a certain direction with an acceleration in the perpendicular direction.



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70. An artificial satellite is moving in a circular path orbit of radius 42,250 km. Calculate its speed if it takes 24 hours to revolve around the earth.



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71. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify the answer.



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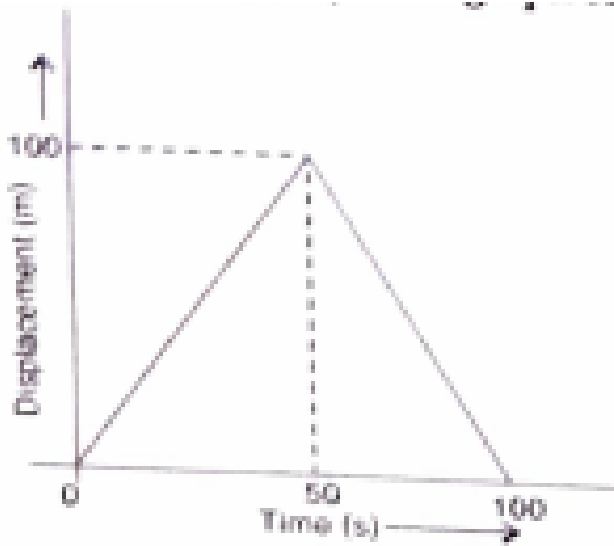
72. How will the equations of motion for an object moving with a uniform velocity change?



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73. A girl walks along a straight path to drop a letter in the letterbox and comes back to her initial position. Her displacement-time graph is shown in Figure. Plot a velocity-time graph for

the same.



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74. A car starts from rest and moves along the x-axis with constant acceleration $5m.s^{-2}$ for 8 seconds. If it then continues with constant

velocity, what distance will the car cover in 12 seconds since it started from the rest ?



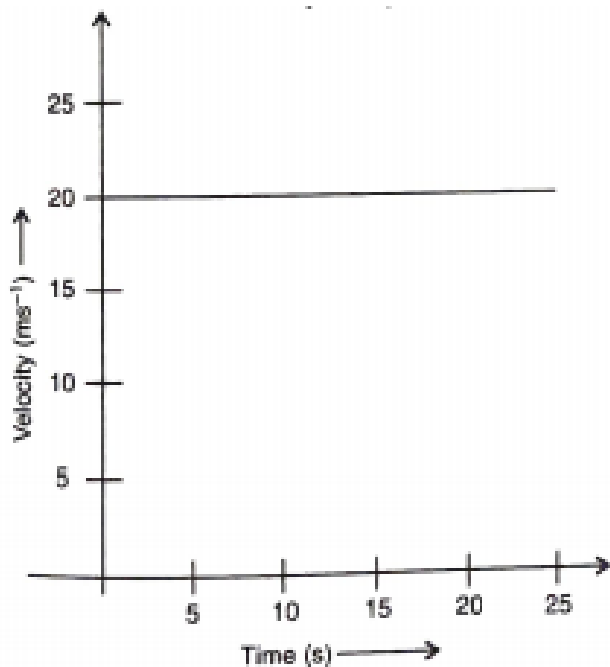
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75. A motorcyclist drives from A to B with a unit speed of 30kmh^{-1} and returns back with a of 20kmh^{-1} . Find its average speed.



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76. The velocity time graph shows the motion of a cyclist Find



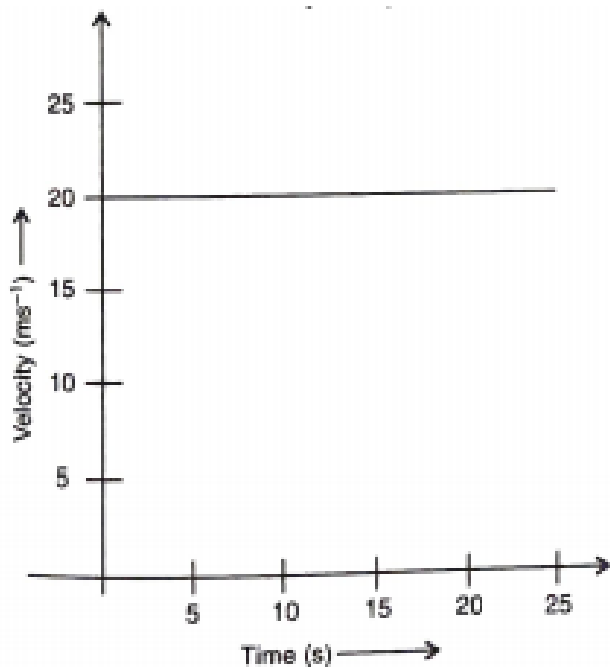
its

acceleration.



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77. The velocity time graph shows the motion of a cyclist Find



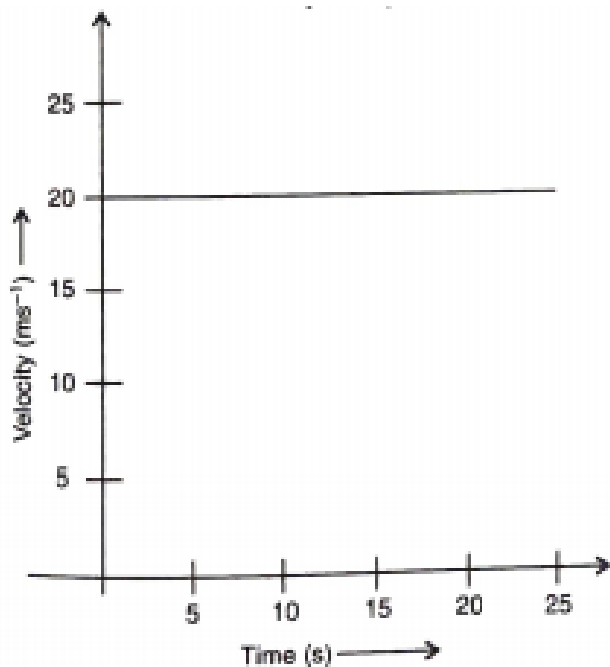
its

velocity.



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78. The velocity time graph shows the motion of a cyclist Find



the

distance covered by the cyclist in 15 seconds.



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79. Draw a velocity versus time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.



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80. A body is dropped from rest at a height of 150 m and simultaneously another body is dropped from rest from a point 100 m above the ground. What is their difference in height

after they have fallen 2s? How does the differences in height vary with time.



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81. An object starting from rest travels 20 m in first 2s and 160 m in next 4 s. What will be the velocity after 7s from the start.



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82. using the following data, draw time-displacement graph for a moving object.

Graph for a moving object

Time (s)	0	2	4	6	8	10	12	14	16
Displacement (m)	0	2	4	4	4	6	4	2	0

Use this

graph to find average velocity for first 4s, for next 4s and for last 6s .



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83. An electron moving with a velocity of $5 \times 10^4 \text{ m.s}^{-1}$ enters into a uniform electric field and acquires a uniform acceleration of

10^4ms^{-2} in the direction of its initial motion.

Calculate the time in which the electron would acquire a velocity double of its initial velocity.



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84. An electron moving with a velocity of $5 \times 10^4 \text{ms}^{-1}$ enters into a uniform electric field and acquires a uniform acceleration of 10^4ms^{-2} in the direction of its initial motion.

Calculate the time in which the electron would acquire a velocity double of its initial velocity.



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85. Obtain a relation for the distance travelled by an object moving with a uniform acceleration in the interval between 4th and 5th seconds.



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86. Two stones are thrown vertically upwards simultaneously with their initial velocities u_1 and u_2 respectively. Prove that the heights

reached by them would be in the ratio of $u_1^2 : u_2^2$ (Assume upward acceleration is $-g$ and downward acceleration to be $+g$).



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87. Distance is a scalar quantity. Give reason.



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88. Justify the statement that the displacement does not depend on the path

travelled?



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89. What is the nature of speed-time graph for uniform motion?



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



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91. Can a body have acceleration in one direction and velocity in another direction?



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92. What is the acceleration of a particle moving with a uniform velocity?



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93. A particle is moving in a circle of diameter 5m. What is the displacement when it completes $1\frac{1}{2}$ revolutions.



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94. A body is thrown in the vertically upwards direction rises up to a height 'h' and comes back to the position of start. Calculate. The total distance travelled by the body.



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95. A body is thrown in the vertically upwards direction rises up to a height 'h' and comes back to the position of start. Calculate. The displacement of the body.



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96. A body has zero average velocity but not zero average speed. Justify.



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97. A person travelling in a bus noted the times and the corresponding distances as indicated on the km stones

... as you draw from

Time	Distance
8 : 00 AM	10 km
8 : 15 AM	20 km
8 : 30 AM	30 km
8 : 45 AM	40 km
9 : 00 AM	50 km

(a) The table is of the type

(C) Name

this type of table.



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98. A person travelling in a bus noted the times and the corresponding distances as indicated on the km stones

... do you draw from

Time	Distance
8 : 00 AM	10 km
8 : 15 AM	20 km
8 : 30 AM	30 km
8 : 45 AM	40 km
9 : 00 AM	50 km

(a) The table is of bus ...

(c

What

conclusion do you draw from this data?



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99. A bus travels a distance of 120km with a speed of 40km/h and returns with a speed of 30km/h .Calculate the average speed for the entire journey.



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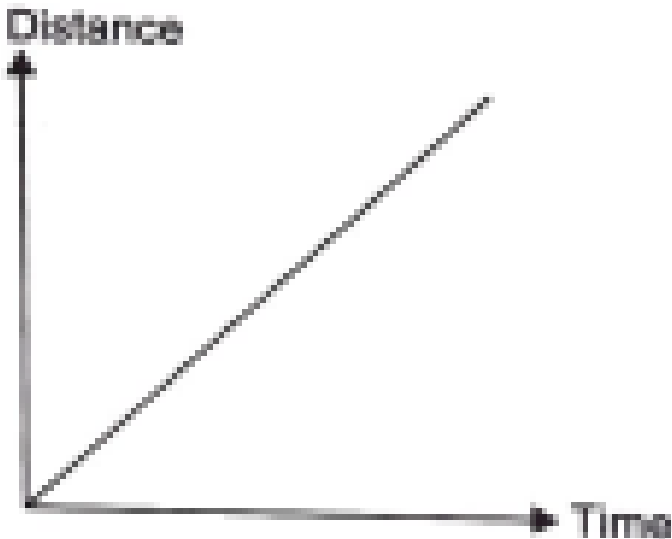
100. Abdul while driving to school, computes the average speed for his trip to be 20 km h^{-1} . On this trip along the same route there os

less traffic and average speed is 40 km h^{-1} .

What is the average speed for Abdul's trip ?

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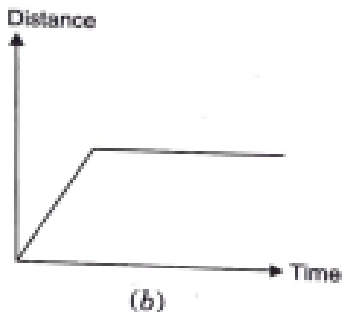
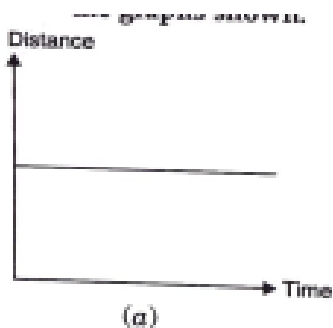
101. State the type of motion represented by the given graph.





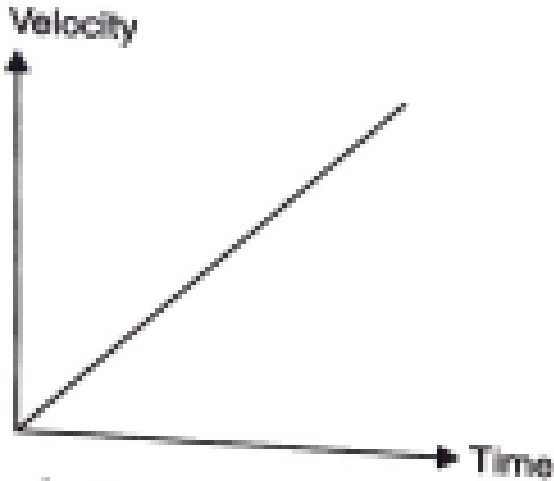
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102. What kind of motion of a body is represented by the graphs shown.



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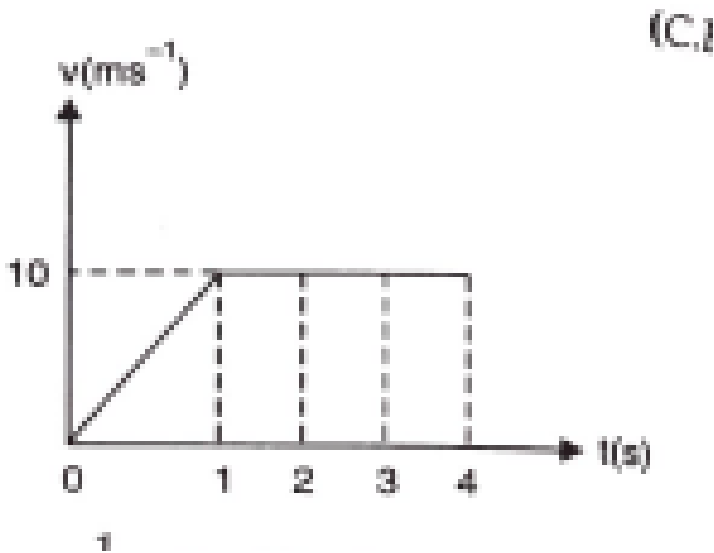
103. Velocity-time graph for a moving body is shown in the diagram. What conclusion can be drawn about the type of motion?



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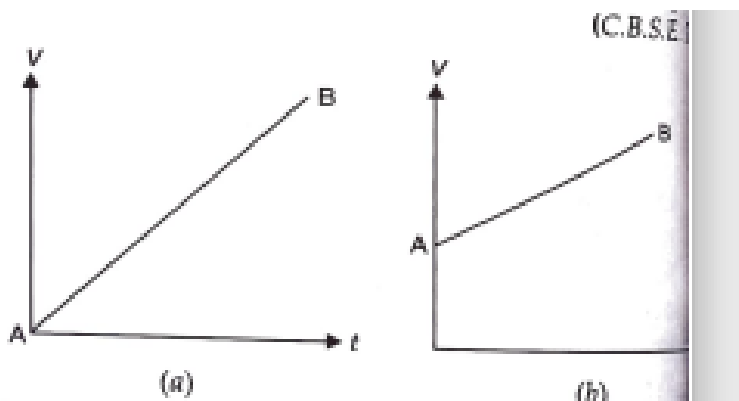
104. Velocity of a particle moving along a straight line in a certain time interval is shown.

What is the distance travelled during acceleration?



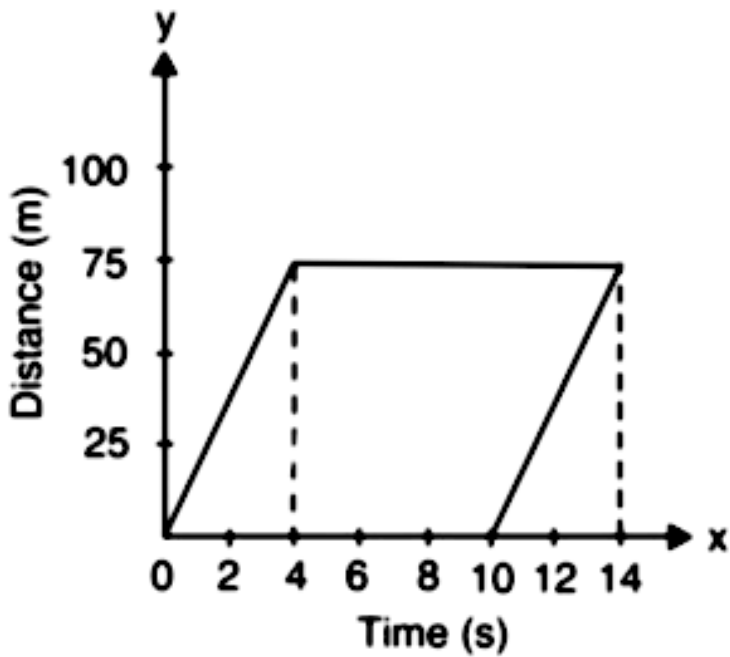
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105. Explain the differences between the two graph.



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106. The graph given below is the distance-time t of an object.

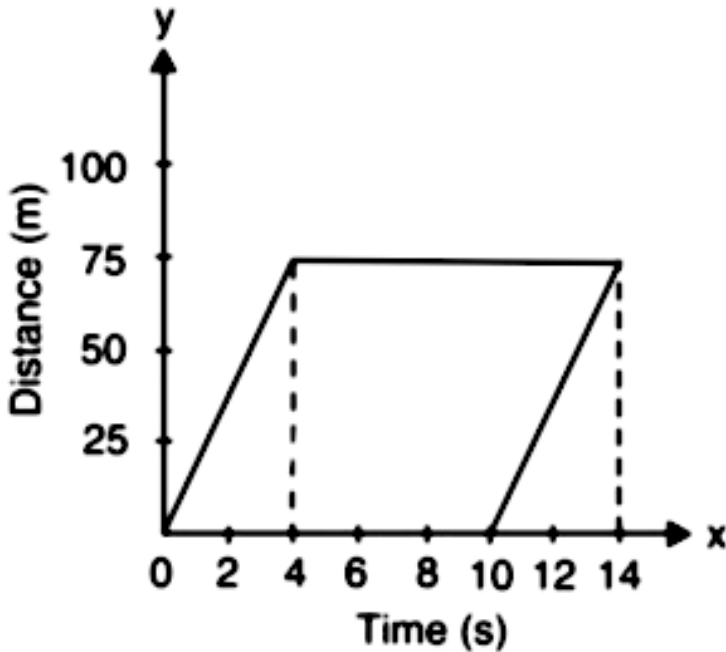


Find the speed of the object during first four seconds of its journey?



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107. The graph given below is the distance-time t of an object.

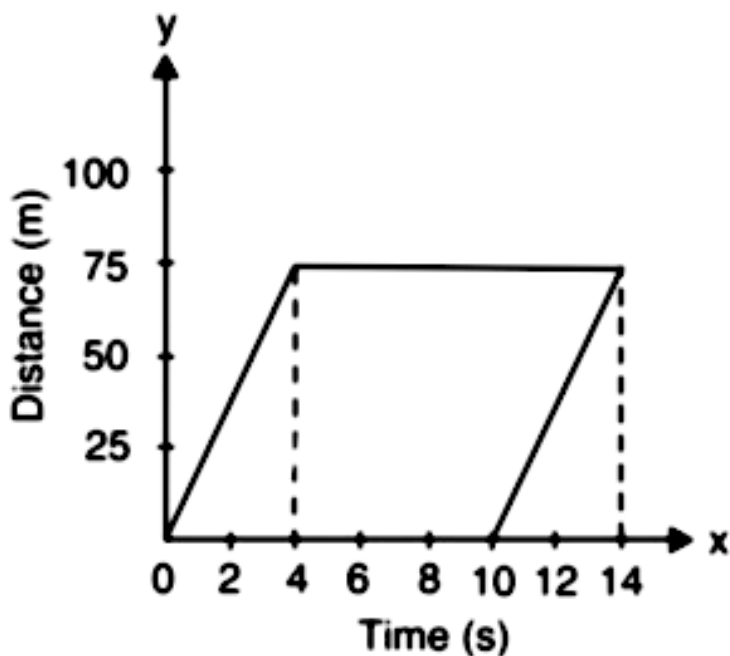


How long was it stationary?



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108. The graph given below is the distance-time t of an object.



Does it

represents a real situation? Justify answer.



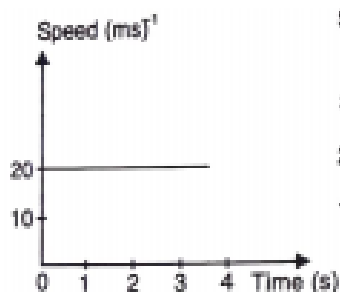
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109. What does the odometer of an automobile measure ?

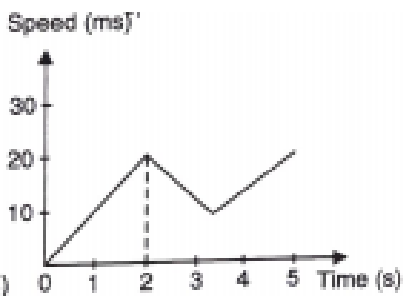


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110. Two graphs for motion of objects moving along a straight line are shown. State how the speed is changing with time in both the cases.



(i)

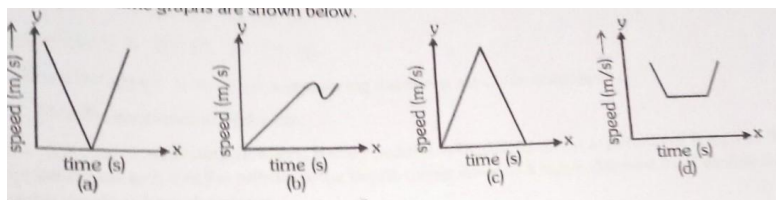


(ii)



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111. Four speed-time graph are shown below:



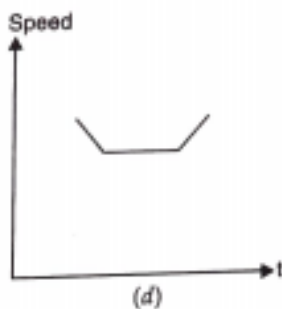
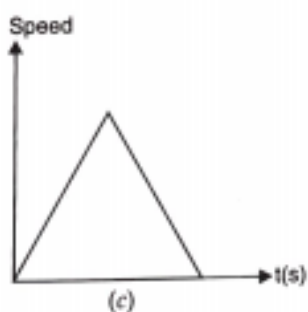
Which

graph represents the following case: (a) A ball thrown vertically upwards and returning to the hand of the thrower? (b) A body decelerating to a constant speed and then accelerating?



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112. Which graph represents a ball thrown vertically upwards and returning to the hand of thrower?



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113. If the acceleration of the particle is constant in magnitude but not in direction,

what type of path does the particle follow?



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114. The direction in which an object moves is given by the direction of velocity of the object and ball by the direction of acceleration.

Explain this statement with suitable example



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115. A bus decreases its speed from 80kmh^{-1} to 50kmh^{-1} in 5 sec. Find the acceleration of the bus.



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116. Give one example each distinguishing between uniform acceleration and non-uniform acceleration.



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117. A train 100 m long is moving with a velocity of 60kmh^{-1} . Find the time it takes to cross the bridge 1 km long.



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118. A body covers a semi circle of radius 7 cm in 5 seconds. Find its velocity.



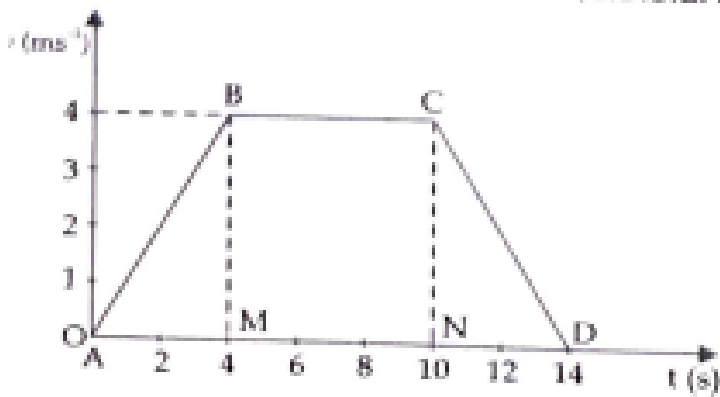
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119. Under what condition is the magnitude of distance and displacement equal?



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120. Study the given graph and answer the following questions:



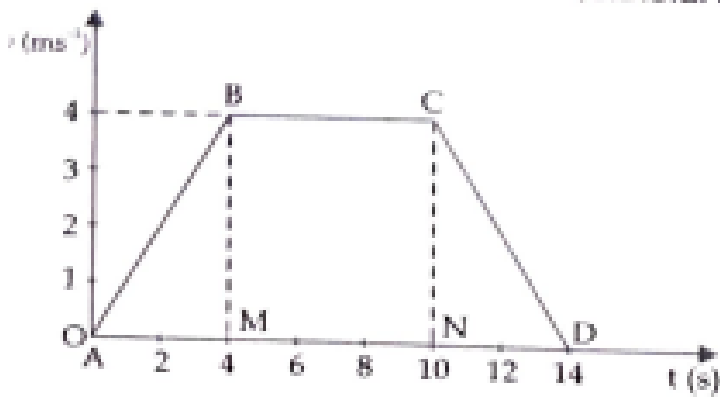
Which

part of the graph shows accelerated.



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121. Study the given graph and answer the following questions:



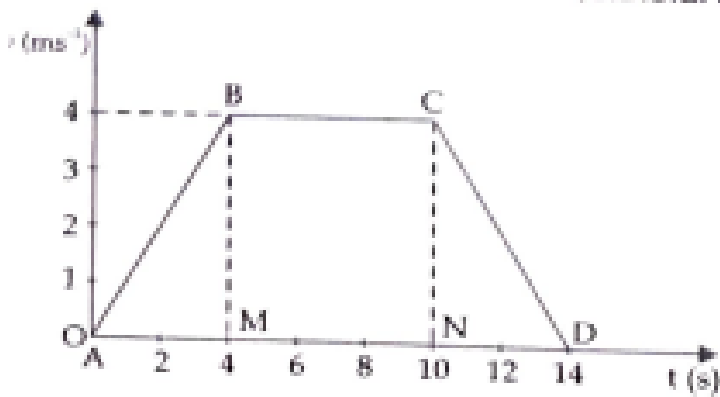
Which

part of the graph shows retarded motion?



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122. Study the given graph and answer the following questions:

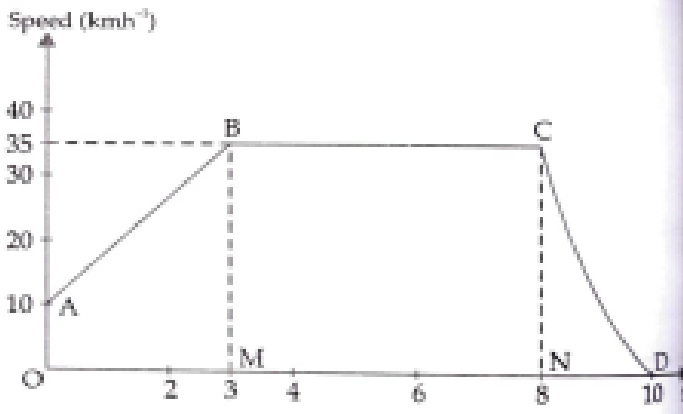


Calculate the distance travelled by the body in first 4 seconds of journey graphically.



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123. The graph below shows how the speed car changes with time:



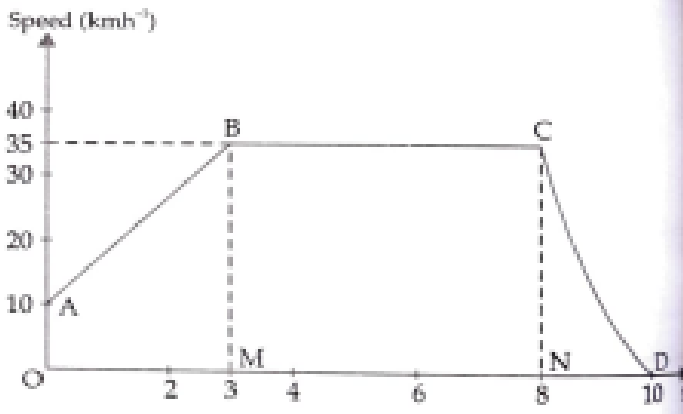
What is

the initial speed of car?



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124. The graph below shows how the speed car changes with time:



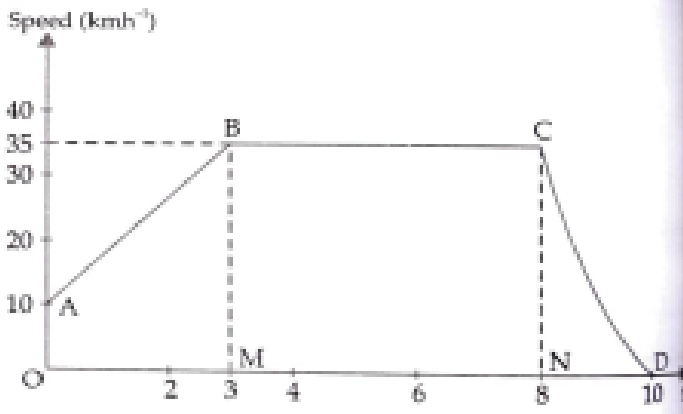
What is

the maximum speed attained by the speed?



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125. The graph below shows how the speed car changes with time:



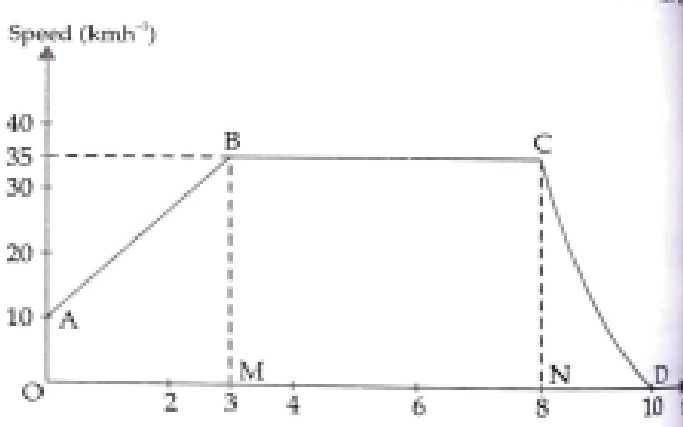
Which

part of the graph shows a acceleration?



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126. The graph below shows how the speed car changes with time:



Which

part of the graph shows vary retardation?



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127. 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 40 seconds ?



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128. Rajeev went from Delhi to Chandigarh on his motorbike. The odometer of that read 4200km at the start of the trip and 4460km at the end of his trip. If Rajeev took 4h 20min to complete his trip, then find the average speed and average velocity in km/h as well as in m/s.



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129. A cyclist goes around a circular track of diameter 105 m in 5 min. Calculate his speed and velocity at the end of 7 minutes 30 seconds.



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130. Why is it advised to tie any luggage kept on the roof of a bus with rope ?



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131. A car is moving with a velocity of 72km/h . By applying brakes a negative acceleration of 0.4m/s^2 is produced. the distance covered by the car before it stops?



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132. A girl drove to a hospital from her home and noted the odometer reading of her car increased by 12 km . The trip took 18 min . What was her average speed?



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133. A girl drove to a hospital from her home and noted the odometer reading of her car increased by 12 km. The trip took 18 min. If she returned home by the same path 7h 30 min after she left, what was her average speed and velocity for the entire trip?



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134. Give one example of motion where an object does not change its speed but its direction of motion changes continuously. Calculate the speed of tip of second hand of watch of length 1.5 cm.



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135. In a long distance race, the athletes were expected to take four rounds of the track such that the line of finish was same as the line of

start . Suppose the length of the track was 200 m.

What is the displacement of the athletes when they touch the finish line?



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136. In a long distance race, the athletes were expected to take four rounds of the track such that the line of finish was same as the line of start . Suppose the length of the track was 200 m.

Is the displacement of an athlete and the distance moved by him at the end of the race equal?



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137. In a long distance race, the athletes were expected to take four rounds of the track such that the line of finish was same as the line of start . Suppose the length of the track was 200 m.

Is the displacement of an athlete and the

distance moved by him at the end of the race equal?



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138. In a long distance race, the athletes were expected to take four rounds of the track such that the line of finish was same as the line of start . Suppose the length of the track was 200 m.

Is the displacement of an athlete and the

distance moved by him at the end of the race equal?



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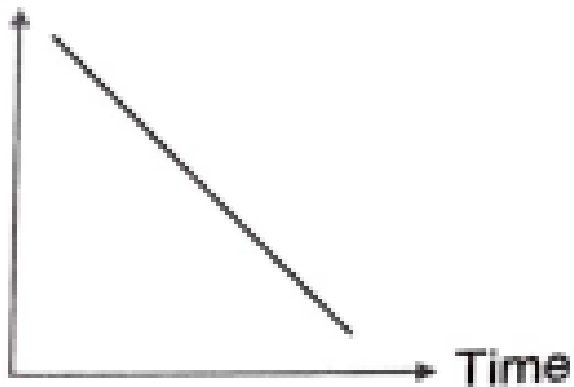
139. Is instantaneous speed and average speed same physical quantities?



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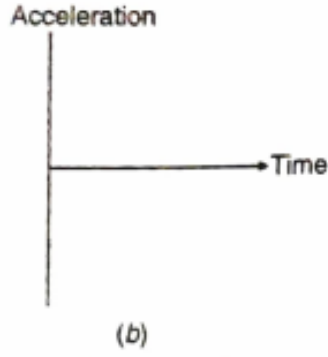
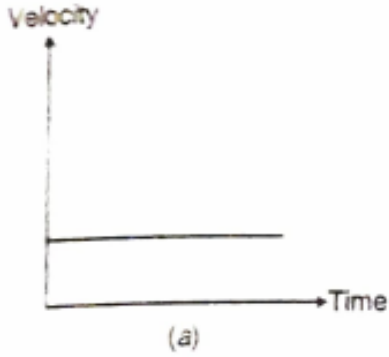
140. Can distance-time graph of this nature of this nature be possessed

Distance



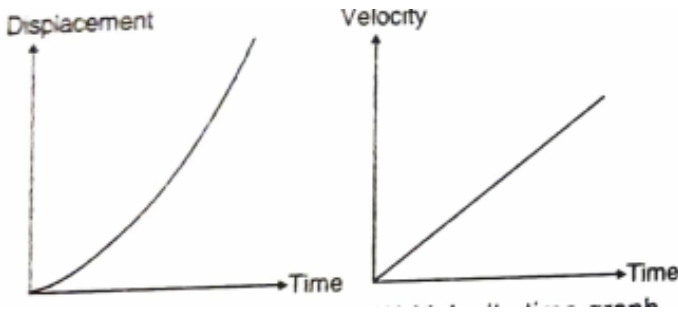
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141. Do the following graphs represent the same type of motion?



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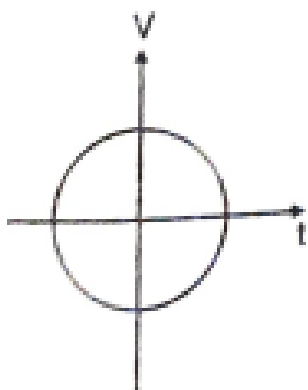
142. Do the following graphs represent the same type of motion?



A

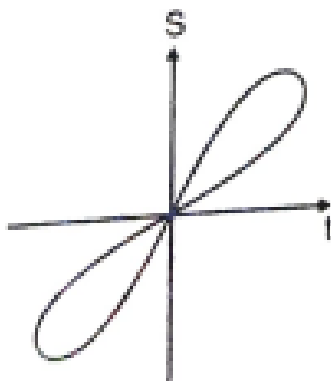
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143. Are the following graphs possible



(a) velocity-time graph

Runs

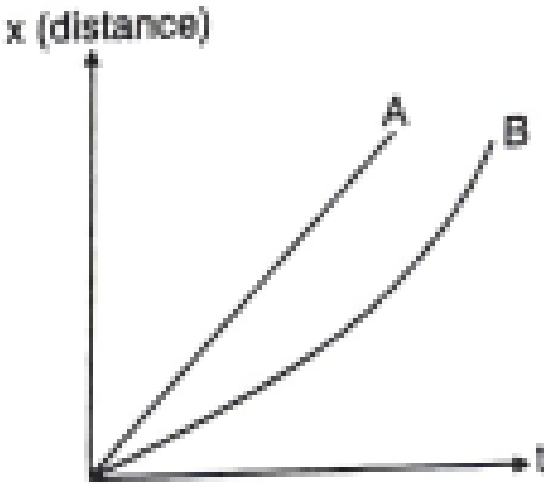


(b) velocity-time graph



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144. Interpret the graphs A and B



Graph A: constant speed



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145. A car moving with a velocity of 20 ms^{-1} is stopped in a distance of 40 m. If the same car is travelling at double the velocity, the

distance travelled by it for same retardation is?



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146. " $v=u+at$ is used in case of variable acceleration".comment



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147. Equations of motions can be used if acceleration depends on time Comment.



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148. State which of the following situations are possible and give an example for each of these.
an object with a constant acceleration but with zero velocity.



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149. State which of the following situations are possible and give an example of each of these?

A body moving with a constant velocity in an accelerated motion.



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150. State which of the following situations are possible and give an example for each of these. an object with a constant acceleration but with zero velocity.



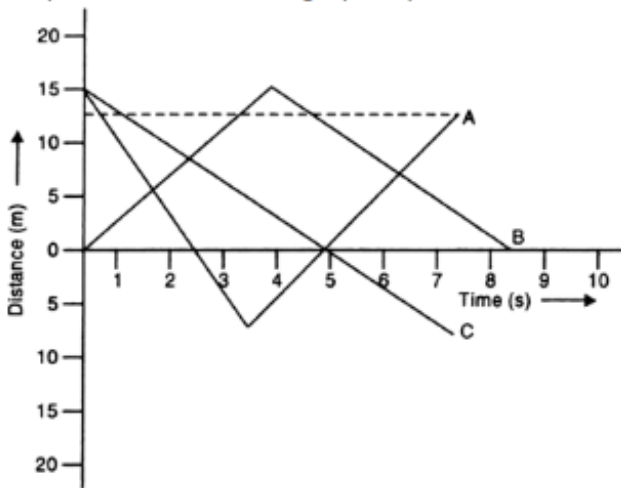
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151. A body moves with a velocity of 2m/s for 5s , then its velocity uniformly increases to 10m/s in 5s . Thereafter its velocity begins to decrease at a uniform rate until it comes to rest after 10s . Plot a $v-t$ graph and $d-t$ graph for the motion of the body. Mark the portions of the graph when the motion is uniform and when the motion is non uniform. From the graph find the total distance moved by the body after 2s and 12s and in the last 10s .



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152. Discuss the graph A,B and C shown in the figure Compare the total distance travelled and the displacements. Which portion of graph represents a motion in which displacement is zero?



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153. A sprinter in a 100m race covers 4m in first second, 30 m in next 4 seconds, 3 m in next 4 seconds and 52 m in another 4 seconds and finishes the race in 10 seconds calculate the average velocity is uniform.



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154. A sprinter in a 100m race covers 4m in first second, 30 m in next 4 seconds, and 52 m in another 4 seconds and finishes the race in 10 seconds In which time interval, is the

average velocity attained by the sprinter maximum? State this velocity in appropriate units.



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155. A sprinter in a 100m race covers 4m in first second, 30 m in next 4 seconds, and 52 m in another 4 seconds and finishes the race in 10 seconds Plot the distance-time graph for the motion of the sprinter. You may assume that

during any given time interval the velocity is uniform.



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156. A sprinter in a 100m race covers 4m in first second, 30 m in next 4 seconds, 3 m in next 4 seconds and 52 m in another 4 seconds and finishes the race in 10 seconds calculate the average velocity is uniform.



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157. A body moves with a velocity of 2m/s for 5s , then its velocity uniformly increases to 10m/s 5s . Thereafter its velocity begins to decrease at a uniform rate until it comes to rest after 10s . Plot a $v\text{-}t$ graph and $d\text{-}t$ graph for the motion of the body. Mark the portions of the graph when the motion is uniform and when the motion is non uniform. From the graph find the total distance moved by the body after 2s and 12s and in the last 10s .



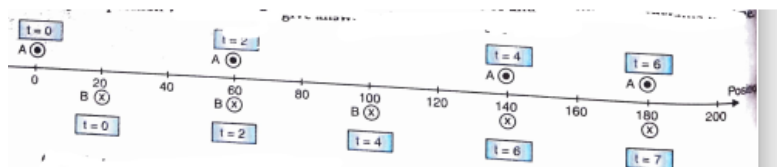
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158. A body moves with a velocity of 2m/s for 5s , then its velocity uniformly increases to 10m/s 5s . Thereafter its velocity begins to decrease at a uniform rate until it comes to rest after 10s . Plot a $v-t$ graph and $d-t$ graph for the motion of the body. Mark the portions of the graph when the motion is uniform and when the motion is non uniform. From the graph find the total distance moved by the body after 2s and 12s and in the last 10s .



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159. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



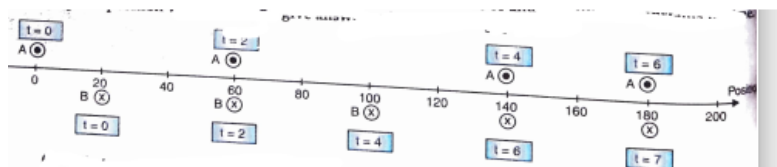
What

were the positions of A and B at $t = 0$?



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160. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



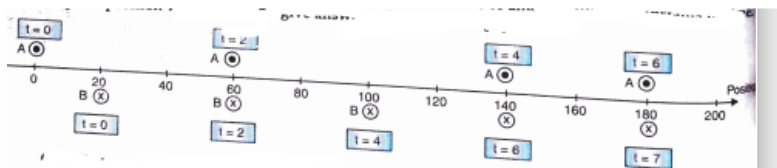
The

speed of A= _____



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161. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



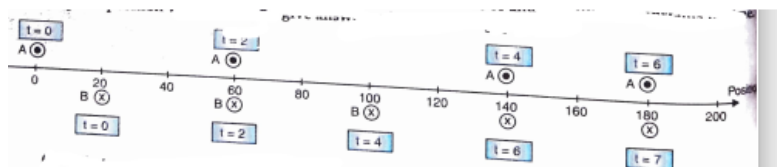
Draw a

velocity-time graph for A and B.



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162. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



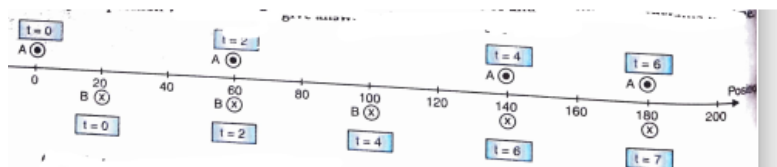
Who will

cover a distance of 180 m first?



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163. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



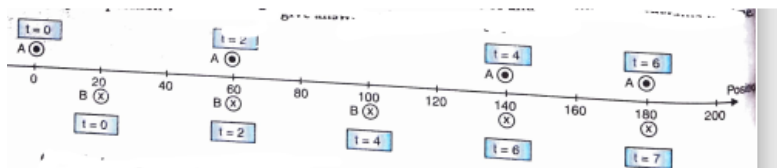
What

were the positions of A and B at $t = 0$?



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164. Interpret the following figure which shows position of bodies A and B at different instants of time. Graph of position versus time and give answers of the following questions:



Draw a

velocity-time graph for A and B.



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