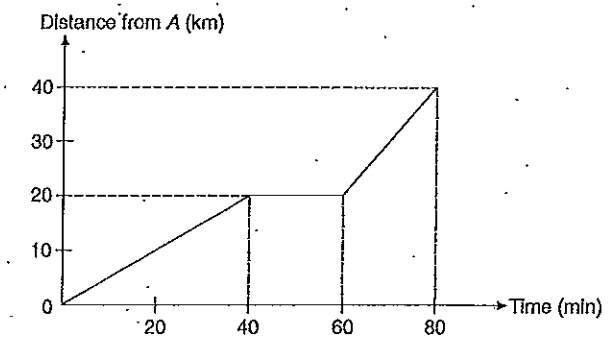
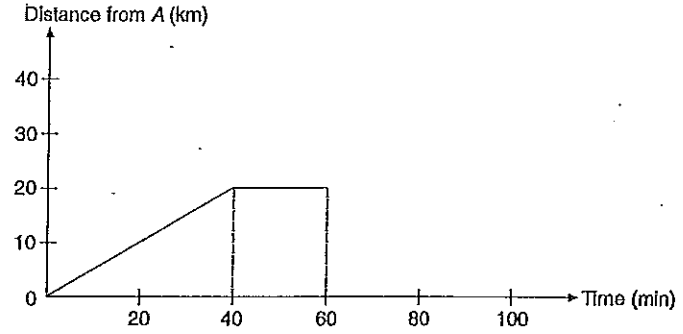
10. The diagram shows the travel graph of a taxi from Town A.



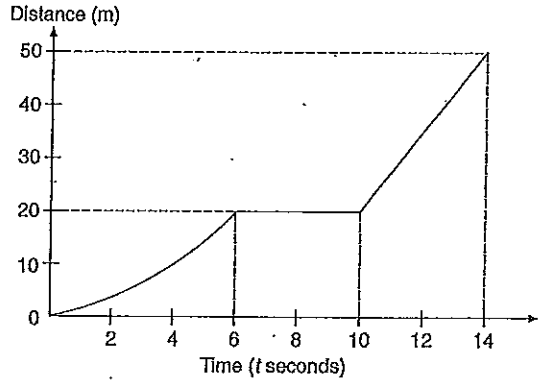
(a) Find, in kilometres per hour,
  (i) the speed during the first 40 minutes,
  (ii) the speed during the last 20 minutes,
  (iii) the average speed for the whole journey.

(b) Calculate the time when the taxi is stationary as a percentage of the total tim taken.

(c) The diagram below shows the journey of the same taxi in the first hour. If it the returned to A in a further 30 minutes,
  (i) complete the distance-time graph,
  (ii) find its average speed for the whole journey.



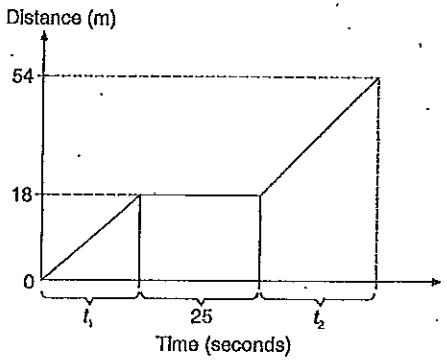
11. The diagram shows the distance-time graph for the first 14 seconds of a particle. Find
  (a) the average speed during the first 6 seconds,
  (b) the speed during the last 4 seconds,
  (c) the acceleration when $t = 12$.



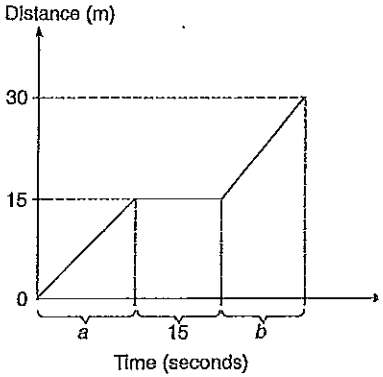
12. The diagram shows the distance-time graph for a particle which travels a distance of 18 m in t_1 seconds at an average speed of v m/s. After stopping for 25 seconds, the particle travelled a further 36 m in t_2 seconds at the same average speed of v m/s. The total time taken for the whole journey is 85 seconds. Find

  (a) the ratio $\frac{t_1}{t_2}$,

  (b) the values of t_1 and t_2.



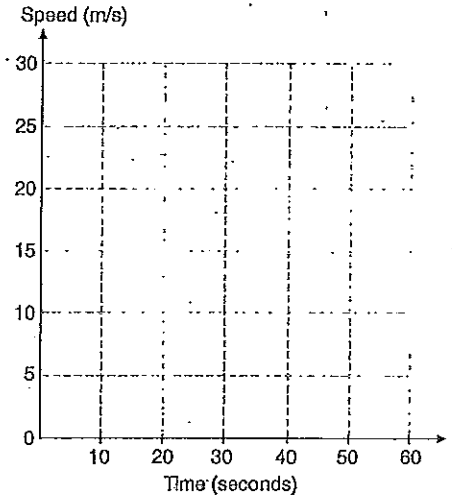
13. The diagram shows the distance-time graph of a particle which travels a distance 15 m in a seconds at an average speed of v m/s. Then after a 15-second stop, th particle goes a further 15 m in b seconds at an average speed of $2v$ m/s. The averag speed of the particle for the whole journey is $\frac{1}{2}$ m/s.
Find
(a) the ratio $\frac{a}{b}$,
(b) the value of a.



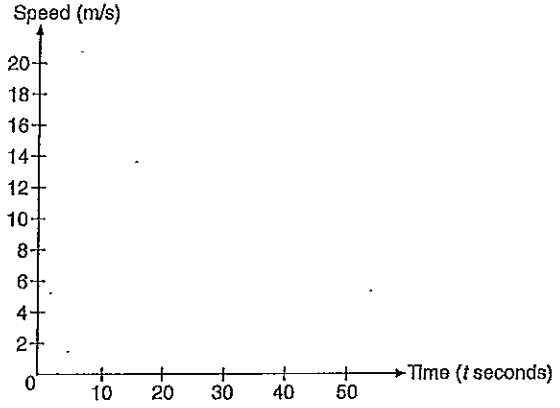
14. A wheel of radius 33 cm is turning about a fixed axis at a rate of $\frac{1}{2}$ revolution pe minute.
Calculate
(a) the angle through which the wheel turns in 40 seconds,
(b) the distance moved by a point on the rim in 40 seconds.
[Take π to be 3.14.]

15. A wheel of radius 42 cm is turning 25 revolutions per minute. Calculate the speed of a point on the rim of the wheel, giving your answers in kilometres per hour.
[Take π to be $\frac{22}{7}$.]

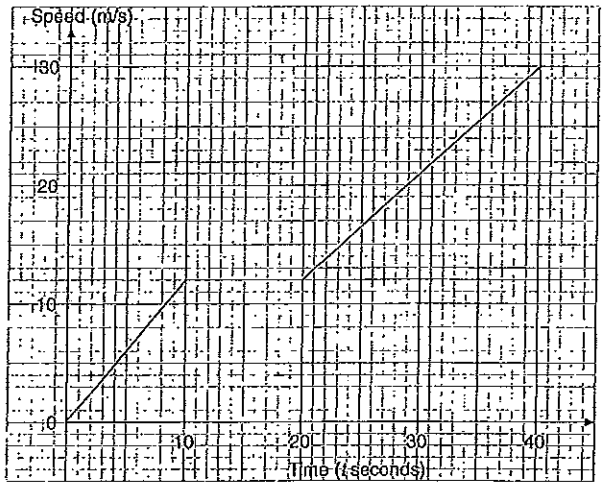
16. A car travels at a constant speed of 20 m/s for 30 seconds. It then slows down at a constant rate until it comes to rest after a further 20 seconds.
(a) On the axes provided, draw the speed-time graph for the car journey.
(b) Calculate the deceleration of the car in the last 20 seconds.
(c) Calculate the distance travelled by the car during the 50 seconds.



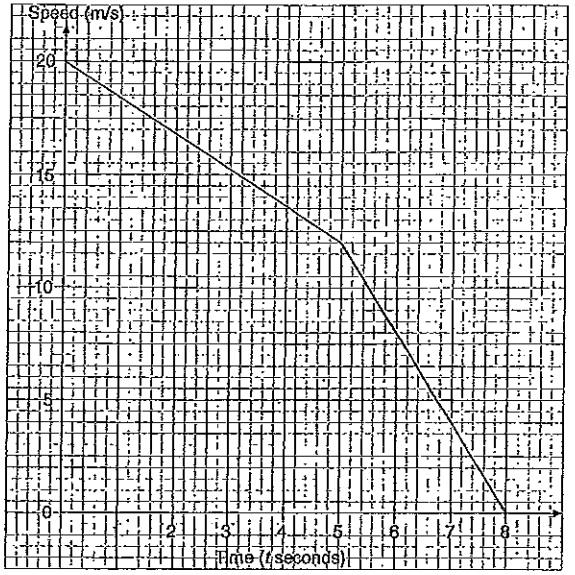
17. A car is retarded uniformly from a speed of 18 m/s to a speed of 12 m/s in a time 30 seconds. It is then brought uniformly to rest after a further 10 seconds.
(a) On the axes provided, draw the speed-time graph of the car.
(b) Calculate the retardation of the car during the first 30 seconds.
(c) Calculate the speed when
(i) $t = 10$, (ii) $t = 36$.
(d) Calculate the average speed of the car during the 40 seconds.



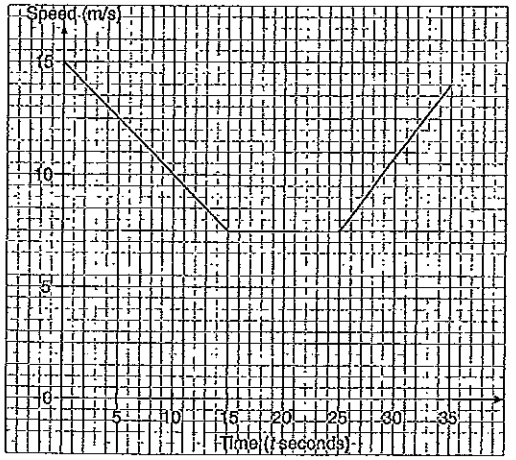
18. The diagram shows the speed-time graph of a car over a period of 40 seconds.
Find
(a) the speed when $t = 29$,
(b) the acceleration during
(i) the first 10 seconds,
(ii) the last 20 seconds,
(c) the total distance travelled,
(d) the average speed for the whole journey.



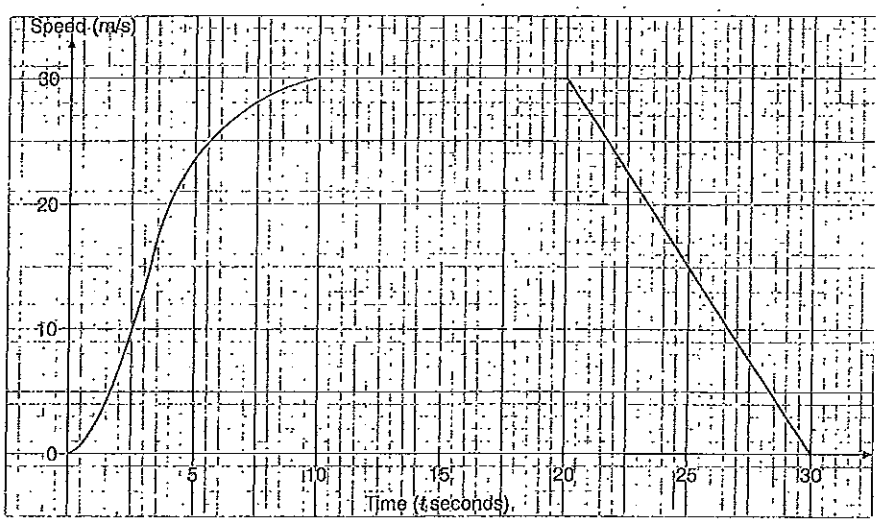
19. The diagram shows the speed-time graph of a particle which is slowing down until it comes to a rest in 8 seconds.
Find
(a) the speed when $t = 4$,
(b) the retardation during
(i) the first 5 seconds,
(ii) the last 3 seconds,
(c) the distance travelled in the 8 seconds,
(d) the average speed for the whole journey.



20. The diagram shows the speed-time graph of a motorcyclist during a period of 35 seconds.
Find
(a) the speed when $t = 28$,
(b) the retardation during the first 15 seconds,
(c) the acceleration during the last 10 seconds,
(d) the total distance travelled in the first 20 seconds.



21. The diagram shows the speed-time graph of a train journey.



Find
(a) the speed when $t = 7$,
(b) the speed when $t = 26$,
(c) the deceleration when $t = 26$,
(d) the distance travelled in the last 20 seconds,
(e) the value of t when the acceleration is greatest.