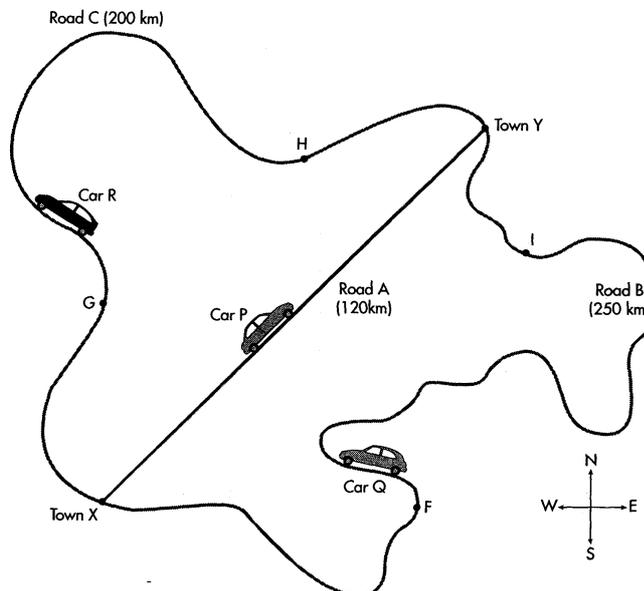


## Motion Revision Questions.

1. A cyclist, travelling at a steady rate, rides 2500 m in 125 s. What is her average speed (in m/s)? [1]
2. A runner covers 1.2 km in 6 minutes. What is his average speed (in m/s and in km/hr)? [2]
3. Consider three cars P, Q and R which all start at town X and travel to town Y by three different roads, as shown in the diagram below.

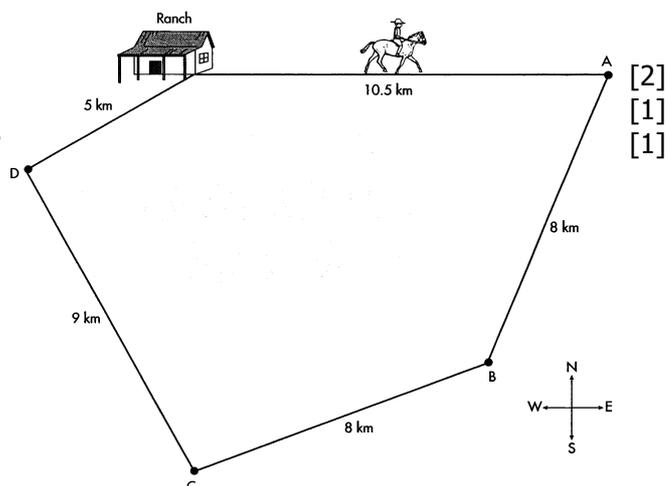
To travel from town X to Y took:

- car P 3 hours
- car Q 5 hours
- car R 8 hours



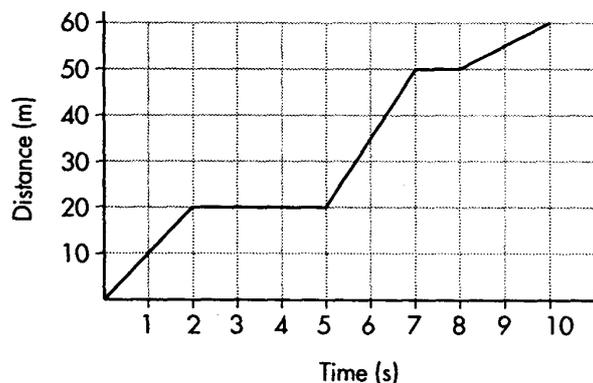
- a. What was the average speed of Car P? [1]
  - b. Why do we use the term 'average speed'? [1]
  - c. What was the displacement of Car P at the end of its journey? [1]
  - d. What was the average speed of Car Q? [1]
  - d. What was the average velocity of Car R? [1]
4. Consider the boundary rider in the diagram below. He takes 3 hours to get to A, another 2 hours to get to B, 2 more to C and 3 more to D. After a total of 12 hours he is back home.

- a. What is his average velocity from D to home? [2]
- b. What is his average speed for the whole journey? [1]
- c. What is his average velocity for the whole journey? [1]

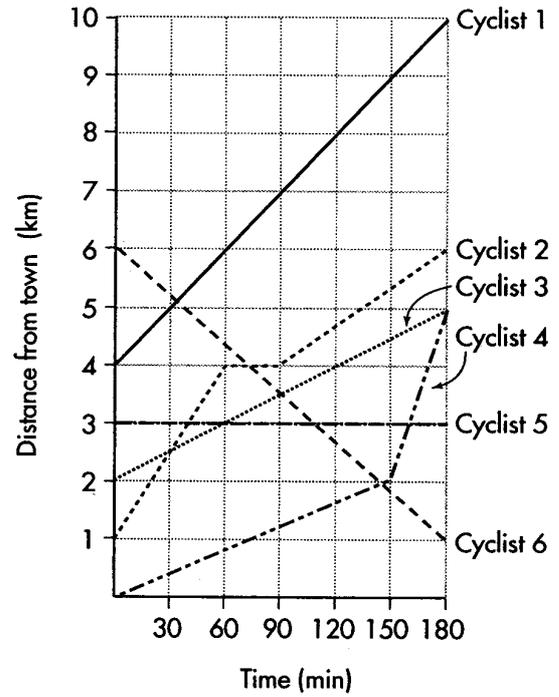


5. The figure below shows how far an object is from the start point P over a 10 second time period. Use the graph to answer the questions on the next page.

- a. How far was the object from P at  $t = 1$  s? [1]
- b. What was the object doing between  $t = 2$  and  $t = 5$  s? [1]
- c. What was the total distance travelled? [1]
- d. When was object travelling at the fastest speed? [1]
- e. What was the average speed for the whole journey? [2]
- f. When was the object stationary? [1]

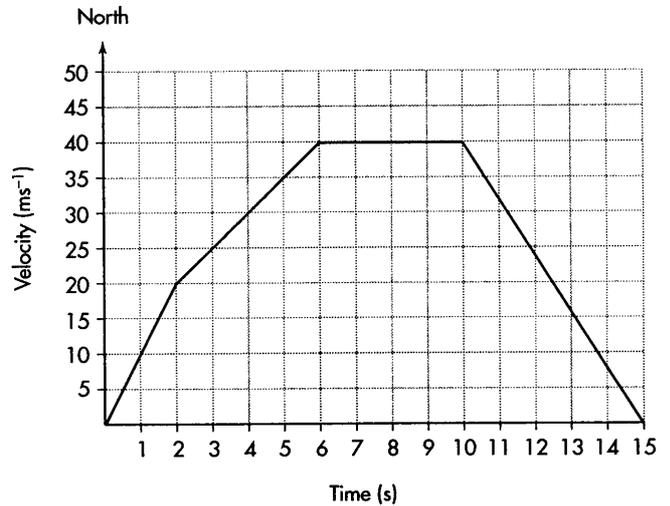


6. The figure to the right shows the distances of several cyclists from a town over a three hour period.
- Which cyclist travelled the furthest? [1]
  - Which cyclist had the greatest average speed? [1]
  - What was the average speed of cyclist 1 (km/hr)? [1]
  - Describe the motion of cyclist 5. [1]
  - Which two cyclists were furthest apart after 3 hours? [1]



7. A car initially at rest accelerates at  $3 \text{ m/s}^2$  for 12 s. What is its speed after  $t = 4, 8$  and 12 s? [2]
8. A rock falls from the top of a cliff onto a roadway below. It takes 2 s to fall and its speed when it hits the road is 20 m/s. What acceleration does gravity give the rock as it falls? Assume no air friction. [1]
9. A car moving at 60 m/s crashes into a wall and comes to rest in 0.25 s. What acceleration stops the car? [1]
10. A rocket takes off and accelerates at  $50 \text{ m/s}^2$  until its speed is 2000 m/s. How long does this take? [1]
11. The graph below shows how the speed of a car changed with time as it accelerated.

- What was the velocity of the car at  $t = 1, 3, 5, 7, 9, 11$  and 15 s? [2]
- When was the car moving with a constant velocity? [1]
- When was the car accelerating? [1]
- What were the accelerations during these times? [2]
- When was the car decelerating? [1]
- Calculate this deceleration. [1]
- How far did the car travel between  $t = 2$  and 6s? [2]
- What was the total distance travelled? [3]
- What was the total displacement? [1]



12. The graph shows the velocity of an object over time.
- What was the initial speed of the object? [1]
  - What was its initial velocity? [1]
  - What was the displacement of the object after 12s? [2]
  - What was the displacement from 12 to 20s? [2]
  - What total distance did it travel? [1]
  - What was the total displacement after 20s? [1]
  - What was the average speed over 20s? [1]
  - What was the average velocity over 20s? [1]

