**1.** The distance/displacement-time graphs below represent the motion of a car. Match the descriptions with the correct graph.

**Descriptions:**

1. The car is stopped.
2. The car is traveling at a constant speed.

*Distance*

*Distance*

*Distance*

*Displacement*

1. The speed of the car is decreasing.
2. The car is coming back.
* Graph A matches description \_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Graph B matches description \_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Graph C matches description \_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Graph D matches description \_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**2.** Students were set up in pairs to run races. Four races were run. Because the students were at different ability levels, some had a head start, but all races were 4 seconds long. The four race results are shown below as distance versus time graphs – A to D.

**A. B. C. D.**

**Runner 1**

**Runner 2**

**Runner 7**

**Runner 8**

**Runner 6**

**Runner 5**

**Runner 4**

**Runner 3**

(i) Which graph shows one student with a 10 metre head start. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(ii) In which race did the students finish side by side (together) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(iii) In race A, which runner was the fastest runner? Explain your answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(iv) Which of the eight runners was the fastest? Explain your answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(v) Who were the slowest runners? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(vi) Calculate the speed of runner 7.

**3.** Three boys ran a 100metre race and the results were shown on a distance versus time graph shown on the right.

Use this data to answer the following questions:

1. Which runner won the race and what was his time?
2. Which runner ran some of the race at a constant speed? Explain your answer.
3. How long did one of the runners rest for?
4. Calculate the speed of Albert and Charlie.

Velocity (m/s)

**4.** The motion graph on the right shows a school bus trip that happened to be very short (25 seconds long).

**(a)** For each sentence below, choose the best phrase/word or number to fill the blanks. You may choose from some of these phrases/words provided below

|  |  |
| --- | --- |
| * accelerating
 | * constant velocity
 |
| * decelerating
 | * at rest
 |

**Segment 0-A**: The bus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Its velocity changes from 0 to \_\_\_\_\_\_ m/s in 5 s.

**Segment A-B**: The bus is moving at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of 10 m/s for \_\_\_\_\_\_seconds.

**Segment B-C** The bus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Its velocity changes from 10 m/s to \_\_\_ in 3 s.

**Segment C-D** The bus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It has stopped.

**Segment D-E** The bus is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is gradually increasing in velocity.

**(b)\*Hard Q** Calculate the distance travelled by the bus in segment 0- A.