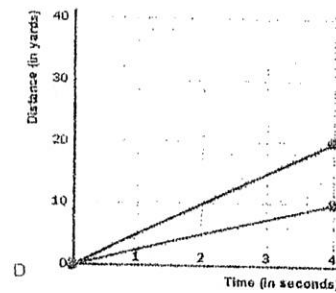
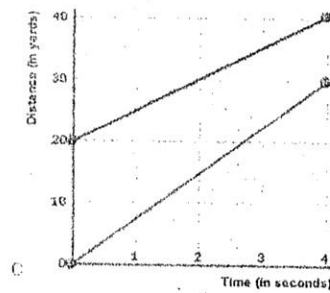
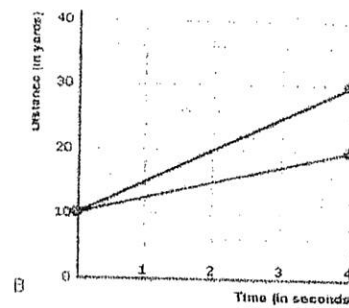
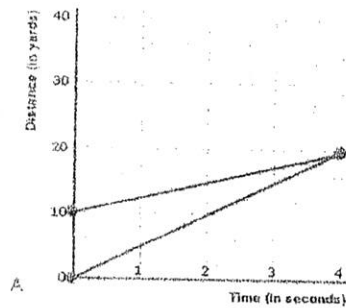


Motion Graphs

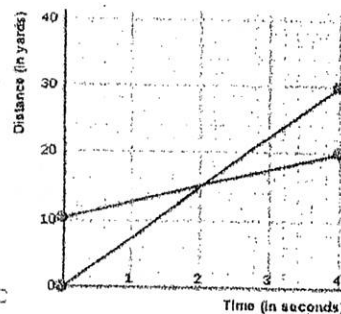
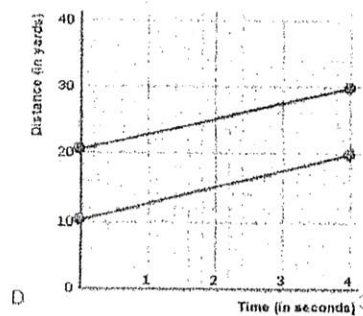
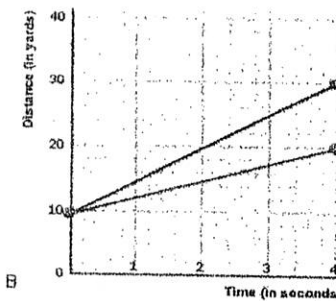
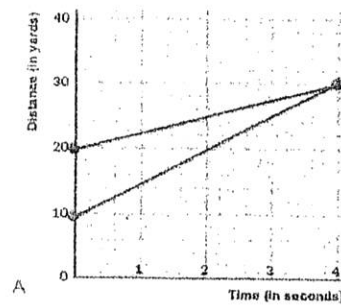
Part 1: Distance vs. Time Graphs

Examine the graphs below.



- 1) Which of the graphs shows that one of runners started 10 yards further ahead of the other?
Explain your answer.

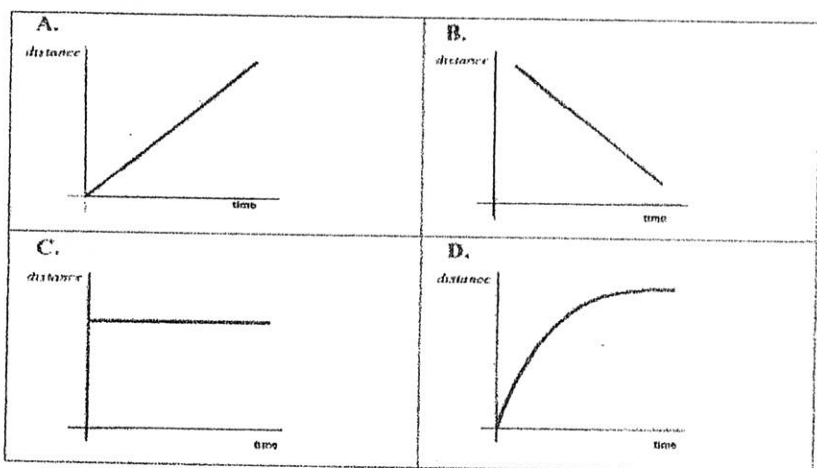
In which of the following graphs below are both runners moving at the same speed?
Explain your answer.



The distance-time graphs below represent the motion of a car. Match the descriptions with the graphs. Explain your answers.

Descriptions:

1. The car is stopped.
2. The car is traveling at a constant speed.
3. The speed of the car is decreasing.
4. The car is coming back.



Graph A matches description _____ because _____

Graph B matches description _____ because _____

Graph C matches description _____ because _____

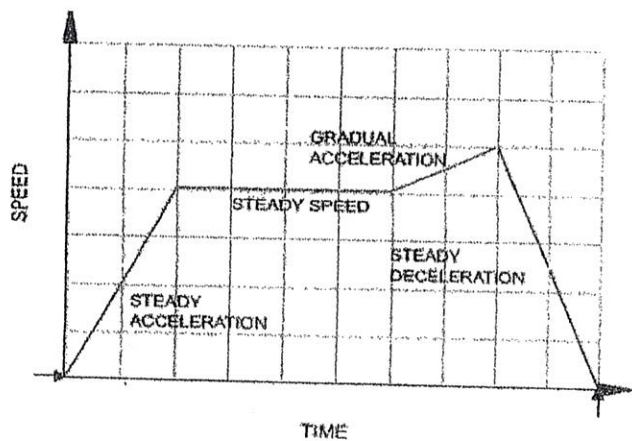
Graph D matches description _____ because _____

Part 2: Speed vs. Time Graphs

Summary:

A speed - time graph shows us how the speed of a moving object changes with time.

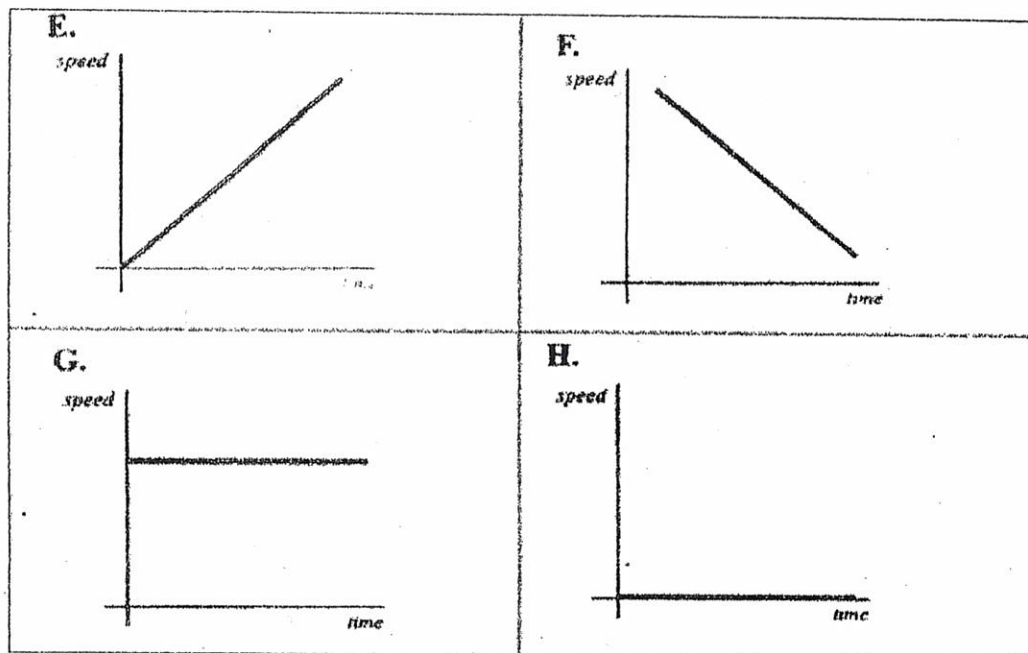
- The steeper the graph, the greater the acceleration.
- A horizontal line means the object is moving at a constant speed.
- A downward sloping line means the object is slowing down.



The speed-time graphs below represent the motion of a car. Match the descriptions with the graphs. Explain your answers.

Descriptions:

5. The car is stopped.
6. The car is traveling at a constant speed.
7. The car is accelerating.
8. The car is slowing down.



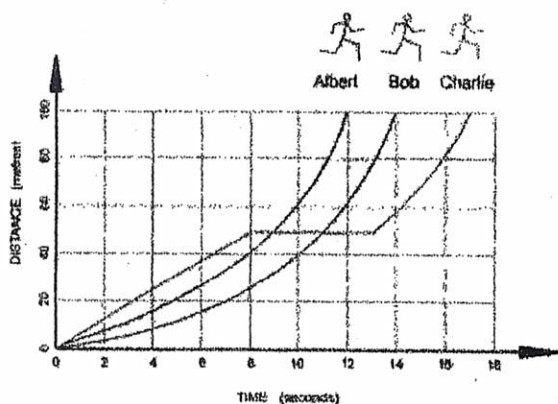
Graph E matches description _____ because _____.

Graph F matches description _____ because _____.

Graph G matches description _____ because _____.

Graph H matches description _____ because _____.

Questions:



Look at the graph above. It shows how three runners ran a 100-meter race. Which runner won the race? Explain your answer.

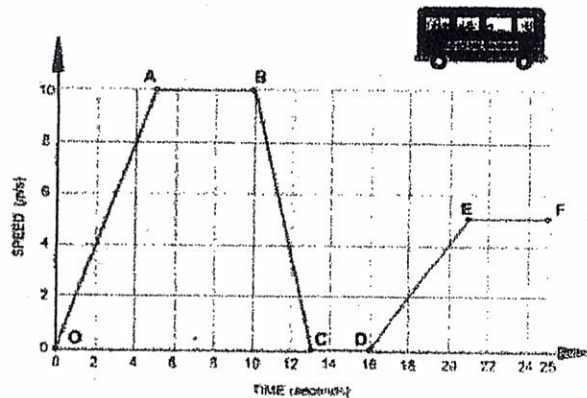
Which runner stopped for a rest? Explain your answer.

How long was the stop? Explain your answer.

How long did Bob take to complete the race? Explain your answer.

Calculate Albert's average speed. (Figure the distance and the time first!)

The graph below shows how the speed of a bus changes during part of a journey



Choose the correct words from the following list to describe the motion during each segment of the journey to fill in the blanks.

- accelerating
- decelerating
- constant speed
- at rest

Segment O-A The bus is _____. Its speed changes from 0 to 10 m/s in 5 seconds.

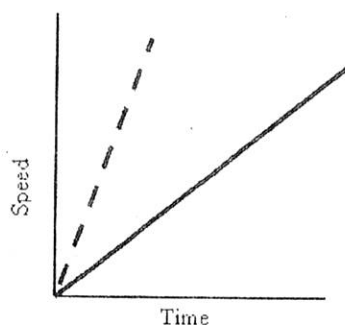
Segment A-B The bus is moving at a _____ of 10 m/s for 5 seconds.

Segment B-C The bus is _____. It is slowing down from 10 m/s to rest in 3 seconds.

Segment C-D The bus is _____. It has stopped.

Segment D-E The bus is _____. It is gradually increasing in speed.

What about comparing two moving objects at the same time?



Both the dashed and solid line show increasing speed.

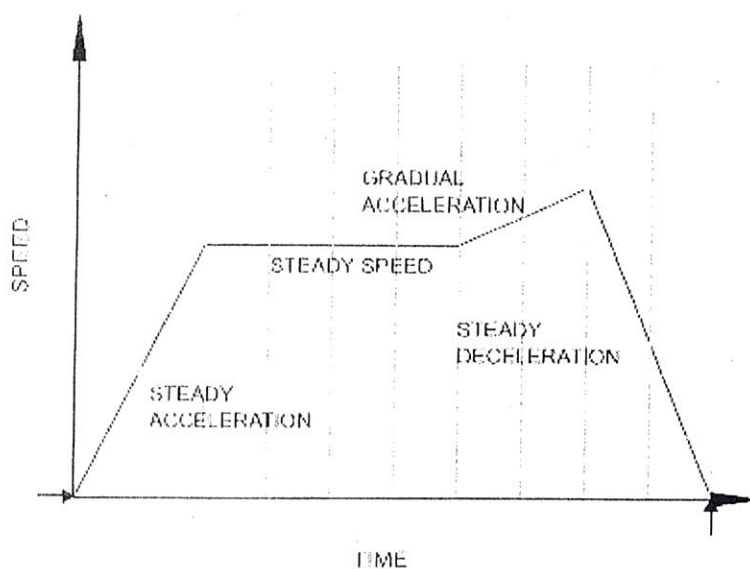
Both lines reach the same top speed, but the solid one takes longer.

The dashed line shows a greater acceleration.

Summary:

A speed - time graph shows us how the speed of a moving object changes with time.

- The steeper the graph, the greater the acceleration.
- A horizontal line means the object is moving at a constant speed.
- A downward sloping line means the object is slowing down.



(Graph from:

<http://www.bbc.co.uk/schools/gcsebitesize/physics/forces/speedvelocityaccelerationf1rev2.shtml>)