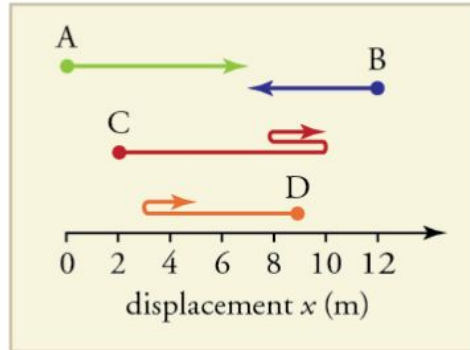


## UNIT 2 PRACTICE PROBLEMS

## AP PHYSICS

## 2.1 POSITION, DISTANCE, AND DISPLACEMENT

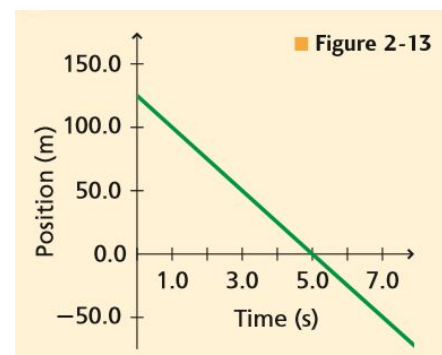


- Find the following for path A in Figure: (a) The distance traveled. (b) The magnitude of the displacement from start to finish. (c) The displacement from start to finish.
- Find the following for path B in Figure: (a) The distance traveled. (b) The magnitude of the displacement from start to finish. (c) The displacement from start to finish.
- Find the following for path C in Figure: (a) The distance traveled. (b) The magnitude of the displacement from start to finish. (c) The displacement from start to finish.
- Find the following for path D in Figure: (a) The distance traveled. (b) The magnitude of the displacement from start to finish. (c) The displacement from start to finish.

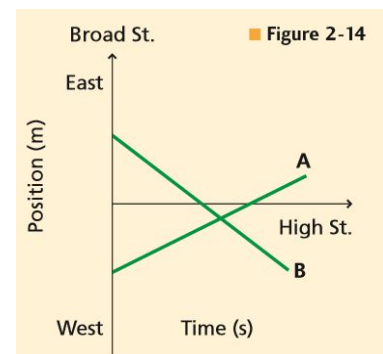
## 2.2 POSITION VS TIME GRAPHS

For problems 5-7, refer to Figure 2-13.

- Describe the motion of the car shown by the graph.
- Draw a motion diagram that corresponds to the graph.
- Answer the following questions about the car's motion. Assume that the positive  $x$ -direction is east and the negative  $x$ -direction is west.
  - When was the car 25.0 m east of the origin?
  - Where was the car at 1.0 s?



- Describe, in words, the motion of the two pedestrians shown by the lines in Figure 2-14. Assume that the positive direction is east on Broad Street and the origin is the intersection of Broad and High Streets.



## UNIT 2 PRACTICE PROBLEMS

## AP PHYSICS

9. Odina walked down the hall at school from the cafeteria to the band room, a distance of 100.0 m. A class of physics students recorded and graphed her position every 2.0 s, noting that she moved 2.6 m every 2.0 s. When was Odina in the following positions?
- 25.0 m from the cafeteria
  - 25.0 m from the band room
  - Create a graph showing Odina's motion.

## 2.3 SPEED AND VELOCITY

10. A bike travels at a constant speed of 4.0 m/s for 5.0 s. How far does it go?
11. Light from the Sun reaches Earth in 8.3 min. The speed of light is  $3.00 \times 10^8$  m/s. How far is Earth from the Sun?
12. A car is moving down a street at 55 km/h. A child suddenly runs into the street. If it takes the driver 0.75 s to react and apply the brakes, how many meters will the car have moved before it begins to slow down?
13. Nora jogs several times a week and always keeps track of how much time she runs each time she goes out. One day she forgets to take her stopwatch with her and wonders if there's a way she can still have some idea of her time. As she passes a particular bank, she remembers that it is 4.3 km from her house. She knows from her previous training that she has a consistent pace of 4.0 m/s. How long has Nora been jogging when she reaches the bank?
14. You and a friend each drive 50.0 km. You travel at 90.0 km/h; your friend travels at 95.0 km/h. How long will your friend have to wait for you at the end of the trip?
15. The graph in Figure 2-22 describes the motion of a cruise ship during its voyage through calm waters. The positive X-direction is defined to be south.
- Describe, in words, the motion of the cruise ship.
  - What is the ship's average speed?
  - What is its average velocity?
  - Draw a velocity vs. time graph to represent the motion of the cruise ship.

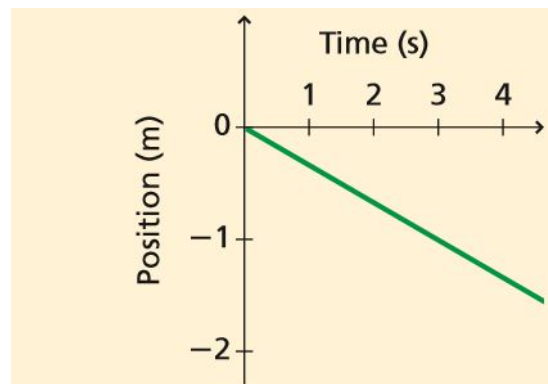
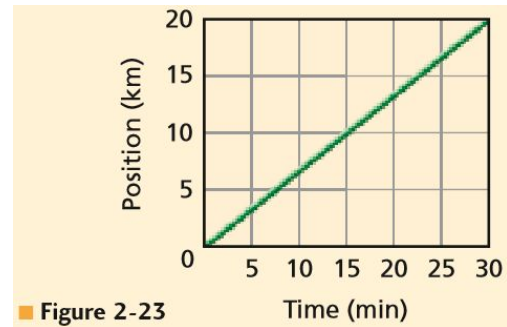


Figure 2-22

## UNIT 2 PRACTICE PROBLEMS

## AP PHYSICS

16. The graph in Figure 2-23 represents the motion of a bicycle.
- Describe, in words, the motion of the bicycle.
  - What is the bicycle's average speed?
  - What is its average velocity?
  - Draw a velocity vs. time graph to represent the motion of the bicycle.



17. When Marilyn takes her pet dog for a walk, the dog walks at a very consistent pace of 0.55 m/s.
- Draw a position-time graph to represent Marilyn's dog walking the 19.8-m distance from the front of her house to the nearest fire hydrant.
  - Draw a velocity-time graph to represent Marilyn's dog walking the 19.8-m distance from the front of her house to the nearest fire hydrant.