

1. A lobster creeps 10 m along the sea bed in 5 minutes. Find its average speed.
2. A snake slithers up a giant sand dune at 2 m/s. How far will it have moved in a minute?
3. A car cruises at an average speed of 50 miles per hour. How much time will it take to go 600 miles?
4. The strength of gravity at the Earth's surface is 10 newtons per kilogram. Calculate the weight of a car with a mass of 1500 kg.
5. The strength of gravity on the Moon is 1.6 newtons per kilogram. If an astronaut's mass is 80 kg on Earth, what would it be on the Moon?
6. The surface gravity of Jupiter is about 26 newtons per kilogram. What would be the weight of a probe of mass 50 kg at Jupiter's surface?

Refer to the following information for the next four questions.

Match the description provided about the behavior of a cart along a linear track to its best graphical representation. Remember that **velocity** is determined by examining the slope of a position-time graph:

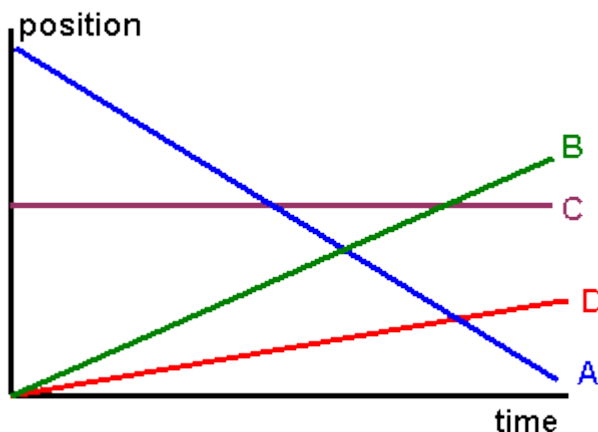
- positive slopes represent motion in a positive direction
- negative slopes represent motion in a negative direction
- zero slopes represent an object remaining in one position, that is, at rest

at rest

traveling slowly in a positive direction

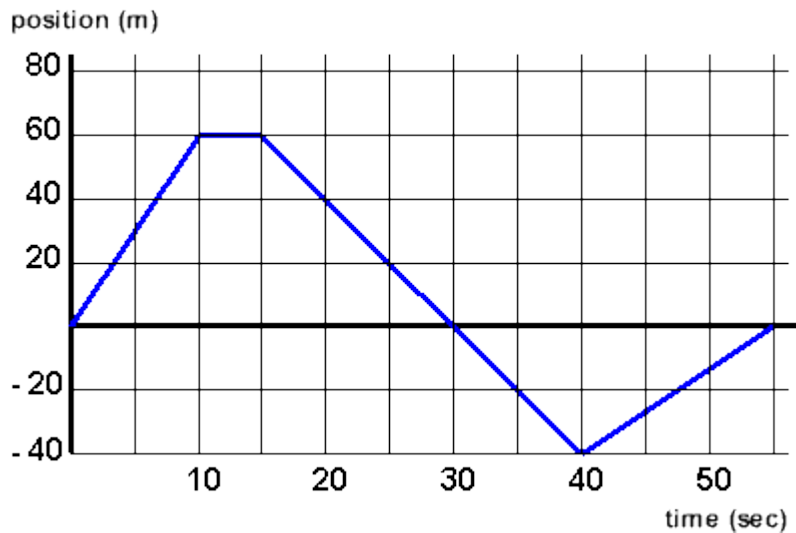
traveling quickly in a negative direction

traveling fast in a positive direction



Refer to the following information for the next four questions.

Given below is a position-time graph displaying the behavior of a race cart along a linear track.



During which time interval did it first travel in a positive direction?

- 0-10 sec 
  10-15 sec 
  15-30 sec 
  30-40 sec 
  40-55 sec

During which second time interval did it later, once again, travel in a positive direction?

- 0-10 sec 
  10-15 sec 
  15-30 sec 
  30-40 sec 
  40-55 sec

During which time interval did it first travel in a negative direction?

- 0-10 sec 
  10-15 sec 
  15-30 sec 
  30-40 sec 
  40-55 sec

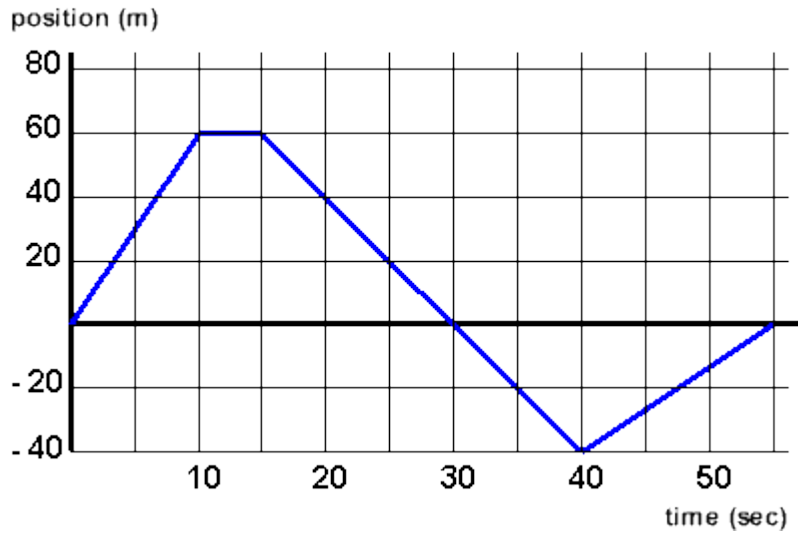
During which second time interval did it continue traveling in a negative direction?

- 0-10 sec 
  10-15 sec 
  15-30 sec 
  30-40 sec 
  40-55 sec

Refer to the following information for the next six questions.

Using the same position-graph as in section two above, answer these questions regarding how far the cart traveled, its average speeds during each interval, and its displacement. Remember that while

- **velocity** is determined by calculating the slope of a position-time graph,
- **distance** is found by calculating comparing the cart's position (the graph's y-axis coordinate) at two times (the graph's x-axis coordinate). Distance is a scalar quantity that does not depend on the direction of travel, and its
- **average speed** during a time interval is defined as the total distance it traveled divided by the total time taken.



How far did the cart travel in the first 10 seconds? How fast was it moving during this time interval?

Briefly describe its behavior between 10 and 15 seconds?

How far did it travel between 15 and 30 seconds? How fast was it moving during this time interval?

How far did it travel between 30 and 40 seconds? How fast was it moving during this time interval?

How far did it travel between 40 and 55 seconds? How fast was it moving during this time interval?

What was the total distance it traveled? What was its final displacement?