Task F

Controlling races with cars at different starting positions

You need to sketch the graphs that control the motion of Blue Waters and Green Grass in different situations. This time they will have different starting positions. Remember in Task C you used controller C to change the start position.

Open Activity 3.3.

a) Sketch a graph of a race such that the two cars travel at the same speed but Green Grass has a 100-mile head start and completes the 300-mile race in 5 hours. Now recreate this race using the software.

What is the speed of each car?

After the cars have travelled for 4 hours, how far apart will they be? How do you know?

Who wins the race? Why should this be obvious?

How long will it take Blue Waters to complete the same race?

f) Without opening the Table of Values window, predict the table of values for this race (on paper).

g) Now open the Table of Values window. Were you correct?

b) Sketch a graph of a race in which:

- Green Grass starts at the starting position and travels at 50 miles an hour.
- Blue Waters has a 50-mile head start (start position = 50 miles).
- The two cars complete the 300-mile race at the same time.

Now edit the graph in Activity 3.3 and play the simulation to check if your graph was correct.

What is Blue Waters’ speed?

Is it possible to find Blue Waters’ speed from the Table of Values? If so, how?

After 5 hours they reach the same position. If Green Grass has travelled 300 miles by that time, and they both keep a constant speed, how far apart will they be 4 hours later?

What is the speed of each car?

Both Blue Waters and Green Grass keep a constant speed. Who is ahead after 6 hours and by how much?

How far apart will they be 4 hours after they met? (Use the graph and table in the software to help you.)

a) Sketch a graph of a race which:

- Green Grass starts the race 150 miles ahead.
- After 5 hours, Green Grass has travelled 300 miles and meets Blue Waters at the new position.

After 5 hours they reach the same position. If Green Grass has travelled 300 miles by that time, and they both keep a constant speed, how far apart will they be 4 hours later?

What is the speed of each car?

Both Blue Waters and Green Grass keep a constant speed. Who is ahead after 6 hours and by how much?

How far apart will they be 4 hours after they met? (Use the graph and table in the software to help you.)