

# Making Tracks

**You need** ★ a calculator

## TECHNOLOGY

The material a tyre is made from affects its performance. Racing tyres need good grip, and the material they are made from needs to be able to cope with high temperatures and speeds.

## Activity One

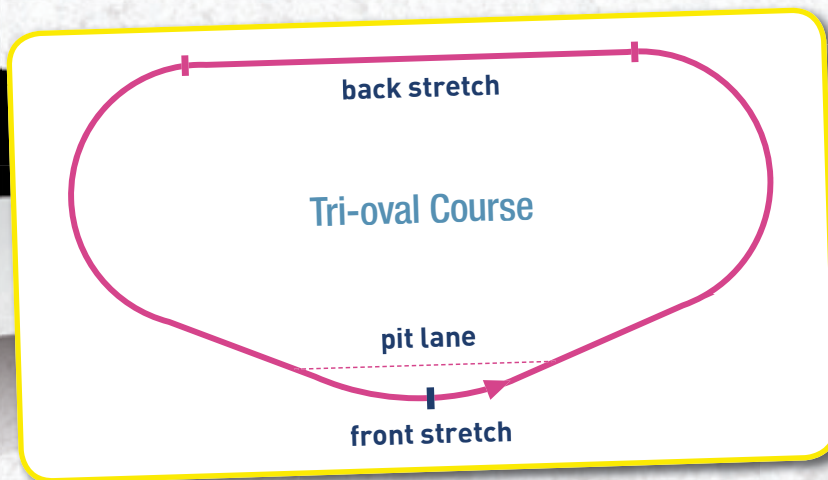
New Zealander John Britten (1950–1995) designed innovative motorbikes. In 1992, Britten motorbikes were raced at the famous Daytona International Speedway and took second and third place, beating bikes produced by companies with million-dollar budgets.

A speedway is a track used for racing motorbikes or cars. Riders or drivers compete to be the first to complete a certain number of laps.

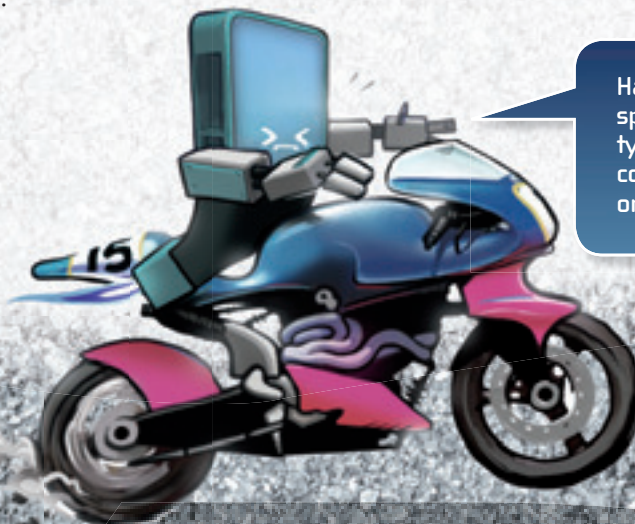
1.

Another name for speedway competitions is oval races, but the racetrack is not always oval. It may have extra curves to make it more challenging.

Here is Daytona's tri-oval track:



If the back stretch of the track is 1200 metres (m) long, estimate the length of one full lap.



Hard tyres wear well and allow high speeds, but they don't grip well. Soft tyres give good grip when braking and cornering, but they slow the bike down on straight sections.



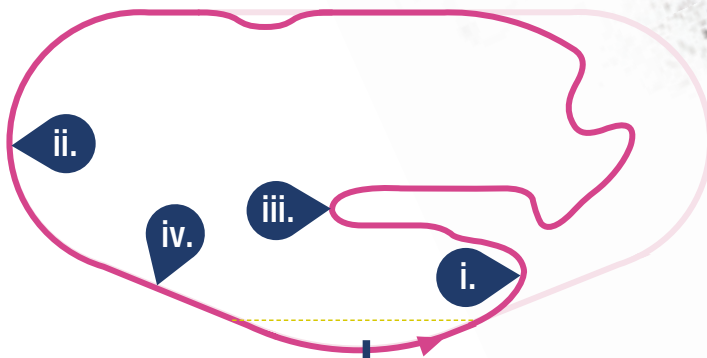
2.

Before a race, riders test the performance of their tyres on the track. Tight curves are the trickiest places.

Here are the results of one team's four trials on the motor course at Daytona Speedway:

### Speeds at points A–D (km/h)

	A	B	C	D
Tyre 1	250	130	245	80
Tyre 2	270	125	260	70
Tyre 3	285	115	275	65
Tyre 4	235	150	220	95



- Match the points i.–iv. with the letters A–D in the table.
- Rank tyres 1–4 from hardest to softest.

### Activity Two

1.

The Indianapolis Motor Speedway Brickyard 400 is a famous race for cars. All cars in the race use the same kind of tyres. In 2008, the tyre manufacturer underestimated the weight of the cars. The surface of the course was also rougher than usual. As a result, many tyres blew out during the race.

- The race is 644 kilometres (km) long. If 1 lap is 4.025 km, how many laps are there in the race?
- The 2008 tyres lasted, on average, about 12 laps. What distance is this?
- Race tyres normally last for about 128 km. What percentage of this distance did the 2008 tyres last?

To keep the drivers safe, the race organisers ran 52 of the laps "under caution". This meant that the cars had to travel more slowly and no car was allowed to overtake another car unless it had crashed. There were also compulsory tyre changes.

2.

- A tyre change usually takes between 10 and 14 seconds. If each car had at least 13 tyre changes, approximately how much time did each car spend in the pit?
- Is it possible to work out the maximum amount of time spent in the pit? Why or why not?

### Focus

Using information from tables and diagrams