2 Fig. 2.1 shows a motorcyclist accelerating along a straight horizontal section of track.

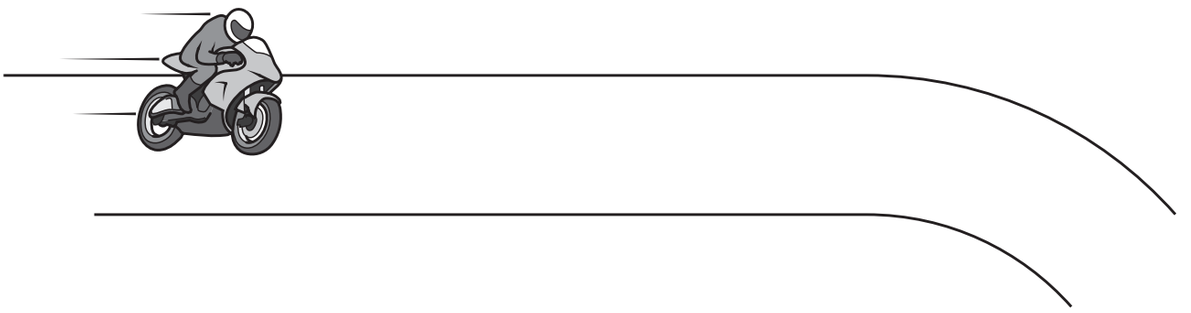

Fig. 2.1

The motorcyclist and motorcycle have a combined mass of 240 kg.

(a) On the straight horizontal section of the track, the motorcyclist accelerates from rest at $7.2\,m/s^2$.

(i) The motorcyclist reaches the end of the straight section of track in 5.3 s.

Calculate the speed of the motorcyclist at the end of the straight section.

speed = ... [2]

(ii) Calculate the resultant force on the motorcyclist and motorcycle on the straight section of track.

resultant force = ... [2]

(b) At the end of the straight section, the track remains horizontal but bends to the right, as shown in Fig. 2.1.

When the motorcyclist reaches the bend, she travels around the bend in a circular path at a constant speed.

(i) Velocity is a vector quantity.

State how a vector quantity differs from a scalar quantity.

.....

..... [1]

(ii) Describe what happens to the velocity of the motorcyclist as she travels around the bend at constant speed.

.....

..... [1]

(iii) Explain why there must be a resultant force on the motorcyclist as she travels around the bend.

.....

.....

..... [2]

[Total: 8]