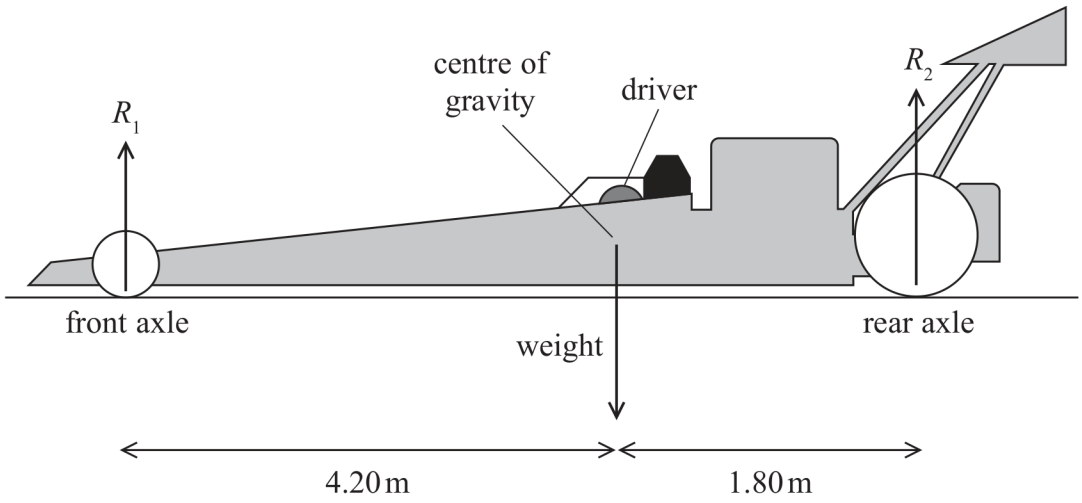
16 A dragster is a racing car designed for a very short race along a completely straight track, so must be able to accelerate at a very high rate. The dragster and driver shown below have a combined weight of 1.23×10^4 N. The centre of gravity is 1.80 m in front of the rear axle.



The front axle of the dragster is 6.00 m from the rear axle.

(a) Calculate the reaction forces R_1 and R_2, shown on the diagram, when the dragster is stationary and not accelerating.

(3)

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R_1 = ...

R_2 = ...

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(b) When the dragster starts, there is a driving force that gives the dragster an initial forward acceleration of 5.50 g.

Calculate the initial driving force on the dragster.

(2)

Initial driving force = ...

(c) The power from the car's engine is constant.

Explain how the force from the engine varies as the car accelerates.

(2)

(Total for Question 16 = 7 marks)