4 Helium is available in small metal canisters. The helium can be used to fill party balloons.

(a) A full canister contains helium gas at a temperature of 18.5°C and a pressure of 1.65×10^{7} Pa. The canister is approximately spherical, with a radius of 4.36×10^{-2} m.

Calculate the mass of helium gas in the full canister.

mass of 6.02×10^{23} atoms of helium = 4.00×10^{-3} kg

(5)

Mass of helium = ...

(b) Student X and Student Y discuss the weight of the canister and its contents after a number of balloons have been filled.

Student X suggests that the weight will have increased, because the upthrust exerted on the canister by the helium will be reduced.

Student Y suggests that the weight will have decreased, because helium has been released from the canister.

Assess which student's suggestion is correct.

(4)

(Total for Question 4 = 9 marks)