

Density level 3 exam question – If you found Level 2 a breeze

Q1 - A student found a billiard ball and wanted to see if this was a modern billiard ball or an older one.



Billiard balls used to be made from a hard plastic called nitrocelluloid. This was changed to a Phenolic resin as the nitrocelluloid was flammable and could explode.

A student decided to test the density of the billiard ball to find when they were made.

Volume of a sphere can be calculated using

$$V = \frac{4}{3}\pi r^3$$

Density of Nitrocelluloid 1.4 – 1.6g/cm³

Density of Phenolic resin 1.7 – 1.9 cm³

- a) Briefly describe 2 methods the student could use to find the volume of the billiard ball. Include the apparatus used, the measurements taken and any calculations carried out. (6)

- b) The diameter of the billiard ball was 57mm. The mass of the ball was 170g. What is the density of the students ball? (4)

- c) Is the billiard ball old or new and justify your answer? (2)
