Exercise 1

Paper 1 style · No calculator

1 6 marks SL 3.1 ●○○ Routine

The points $A(2, -1, 0)$ and $B(8, 1, 3)$ are the ends of a diameter of a sphere.

(a) Find the distance AB. **[2]**

(b) Find the coordinates of the centre of the sphere. **[2]**

(c) Find the volume of the sphere. Give your answer in terms of π. **[2]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$\sqrt{6^2 + 2^2 + 3^2}$ **M1**

$AB = 7$ **A1**

Total 2 marks

MARKSCHEME (b)

$\left(\frac{2+8}{2}, \frac{-1+1}{2}, \frac{0+3}{2}\right)$ **(M1)**

$(5, 0, 1.5)$ **A1**

Total 2 marks

MARKSCHEME (c)

$r = 3.5$ **(A1)**

$V = \frac{4}{3}\pi \times 3.5^3 = \frac{343\pi}{6}$ **A1**

Total 2 marks