Marked example 1

Paper 1 style · No calculator

1 6 marks SL 3.1 ●○○ Routine

The points $A(1, -2, 3)$ and $B(5, 2, 1)$ 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]**

MARKSCHEME (a)

$\sqrt{4^2 + 4^2 + (-2)^2}$ **M1**

$AB = 6$ **A1**

Total 2 marks

MARKSCHEME (b)

$\left(\frac{1+5}{2}, \frac{-2+2}{2}, \frac{3+1}{2}\right)$ **(M1)**

$(3, 0, 2)$ **A1**

Total 2 marks

Note The centre is the midpoint of the diameter.

MARKSCHEME (c)

$r = 3$ **(A1)**

$V = \frac{4}{3}\pi \times 3^3 = 36\pi$ **A1**

Total 2 marks

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