

**Advanced Higher Maths**  
**SQA 2024 Paper 2**  
**Question 10**



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A metal rod is heated such that its volume increases at a constant rate of  $12 \text{ mm}^3$  per minute.

The volume of the rod is modelled, throughout the process, by  $V = 5\pi r^3$ , where  $r$  is measured in millimetres.

Find the rate at which  $r$  is increasing when  $r = 10$ .

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Answer:

$\frac{1}{125\pi}$  mm per minute