

Diagram **NOT** accurately drawn

The sketch shows a curve with equation

 $y = ka_{x}$ 

where k and a are constants, and a > 0

The curve passes through the points (1, 7) and (3, 175).

Calculate the value of k and the value of a.



## M1.

Working	Answer	Mark	Additional Guidance
7 = ka'; 175 = ka <sup>3</sup> $\frac{7}{a}$ , 175 = $\frac{7a^3}{a}$ , 175 = 7a <sup>2</sup> $a^2$ = 25, so $a = 5, k = 1.4$ Or 7 <sup>3</sup> = k <sup>3</sup> a <sup>3</sup> , 175 = ka <sup>3</sup> $\frac{7}{175}$ , $k = 1.4, a = 5$	<i>k</i> = 1.4 <i>a</i> = 5		<b>M1</b> either $a^2 = 25$ or 7 = $ka$ (or 7 = $ka^3$ ) and 175 = $ka^3$ <b>A1</b> $k$ = 1.4 oe <b>A1</b> $a$ = 5 SC Either $a$ = 5 or $k$ = 1.4 oe gets <b>B2</b>
Total for Question: 3 marks			

**E1.** Exponential growth is generally found to be a hard topic at GCSE and this question was no different. Many candidates started sensibly and substituted the values of *x* and *y* to get the pair of equations  $7 = ka^1$  and  $175 = ka^3$ . However, things then went badly wrong, mainly through poor use of index laws. For example, was evaluated as 1, leading to k = 7 and ignoring the second equation, or, the 2 equations were combined to eliminate *k* giving  $a^3 = 175/7$ , followed by a cube root. There appeared to be little evidence of candidates checking the value of *a* and the value of *k* in both equations.