

- 11** The height h cm of a sunflower plant t days after planting the seed is modelled by $h = a + b \ln t$ for $t \geq 9$, where a and b are constants. The sunflower is 10 cm tall 10 days after planting and 200 cm tall 85 days after planting.
- (a) (i)** Show that the value of b which best models these values is 88.8 correct to **3** significant figures. [2]
- (ii)** Find the corresponding value of a . [1]
- (b) (i)** Explain why the model is not suitable for small positive values of t . [1]
- (ii)** Explain why the model is not suitable for very large positive values of t . [1]
- (c)** Show that the model indicates that the sunflower grows to 1 m in height in less than half the time it takes to grow to 2 m. [2]
- (d)** Find the value of t for which the rate of growth is 3 cm per day. [3]