

Higher Maths  
SQA 2017 Paper 1  
Question 9



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A sequence is generated by the recurrence relation  $u_{n+1} = mu_n + 6$  where  $m$  is a constant.

- (a) Given  $u_1 = 28$  and  $u_2 = 13$ , find the value of  $m$ . 2
- (b) (i) Explain why this sequence approaches a limit as  $n \rightarrow \infty$ . 1
- (ii) Calculate this limit. 2
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Answers:

(a)  $m = \frac{1}{4}$  or  $m = 0.25$

(b) (i) Linear recurrence relation and  $-1 < \frac{1}{4} < 1$ .

(ii) 8