



(b) Verify by calculation that  $a$  lies between 9 and 11.

[2]

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(c) Use an iterative formula based on the equation in part (a) to determine  $a$  correct to 2 decimal places. Give the result of each iteration to 4 decimal places. [3]

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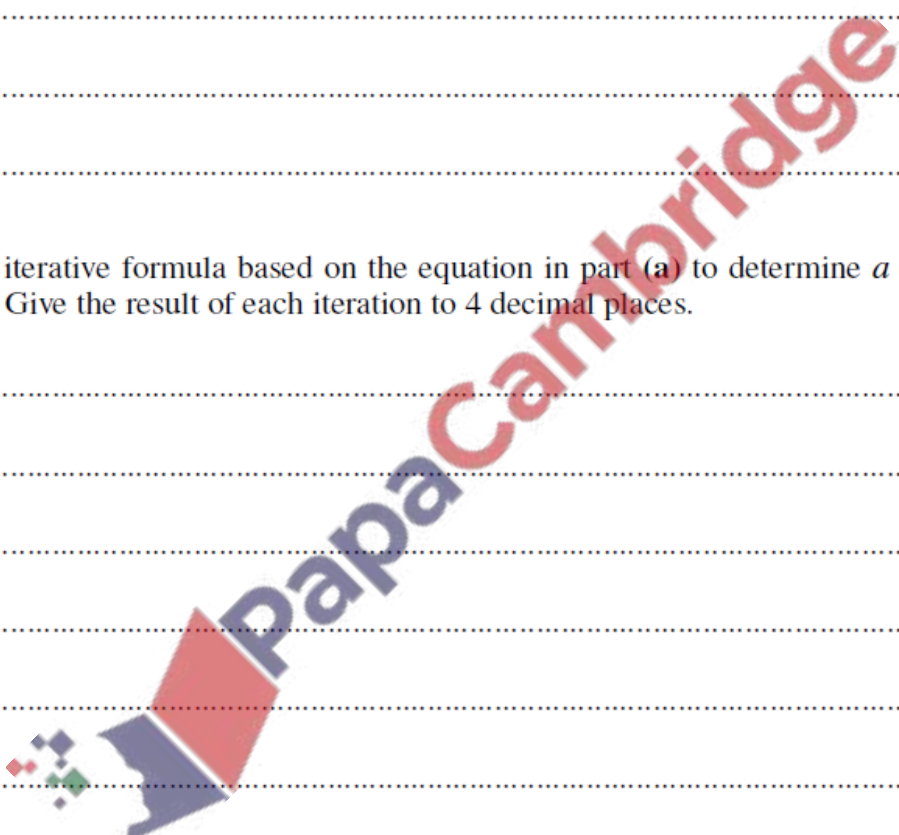
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(c) Use the iterative formula

$$a_{n+1} = \tan^{-1} \left( \frac{1}{3}(1 - \tan^2 a_n - \tan^3 a_n) \right)$$

to determine  $a$  correct to 2 decimal places, giving the result of each iteration to 4 decimal places.

[3]

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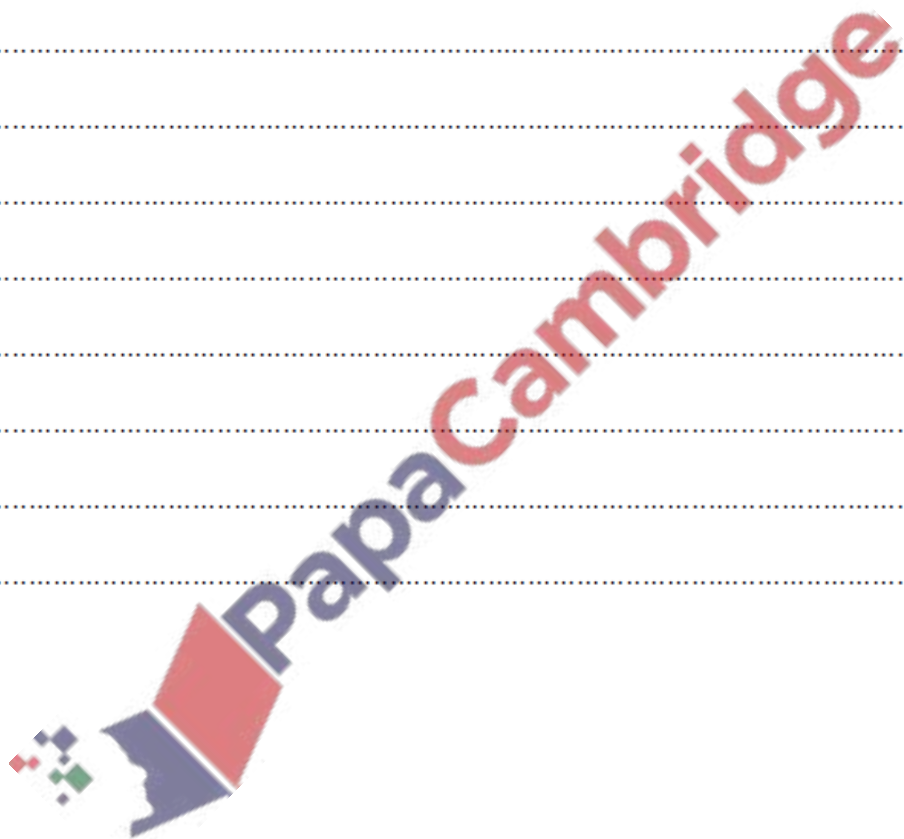
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3. Nov/2021/Paper\_9709/33/No.11(c)

(c) (i) On a sketch of an Argand diagram, shade the region whose points represent complex numbers  $z$  satisfying the inequalities  $0 \leq \arg(z - u) \leq \frac{1}{4}\pi$  and  $\operatorname{Re} z \leq 2$ . [4]

(ii) Find the greatest value of  $|z|$  for points in the shaded region. Give your answer correct to 3 significant figures. [2]

