

1. June/2023/Paper\_9709/21/No.7

- (a) Express  $7 \cos \theta + 24 \sin \theta$  in the form  $R \cos(\theta - \alpha)$ , where  $R > 0$  and  $0^\circ < \alpha < 90^\circ$ . Give the value of  $\alpha$  correct to 2 decimal places. [3]

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- (b) Solve the equation  $7 \cos \theta + 24 \sin \theta = 18$  for  $0^\circ < \theta < 360^\circ$ . [4]

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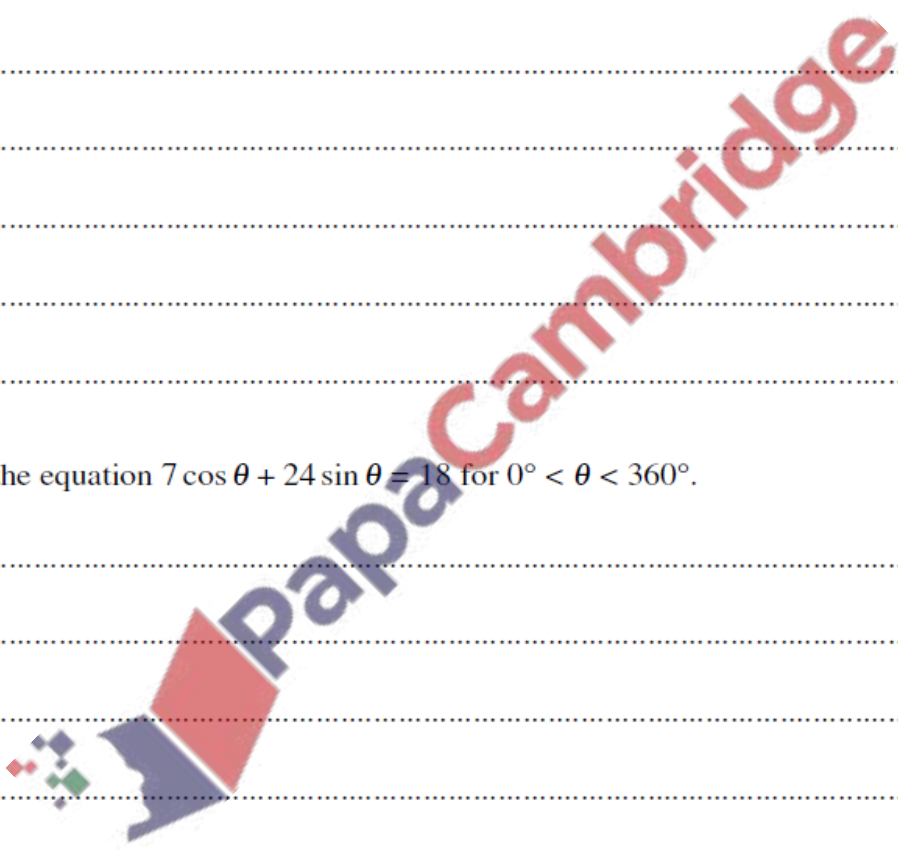
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Use logarithms to solve the equation  $12^x = 3^{2x+1}$ . Give your answer correct to 3 significant figures.

[4]

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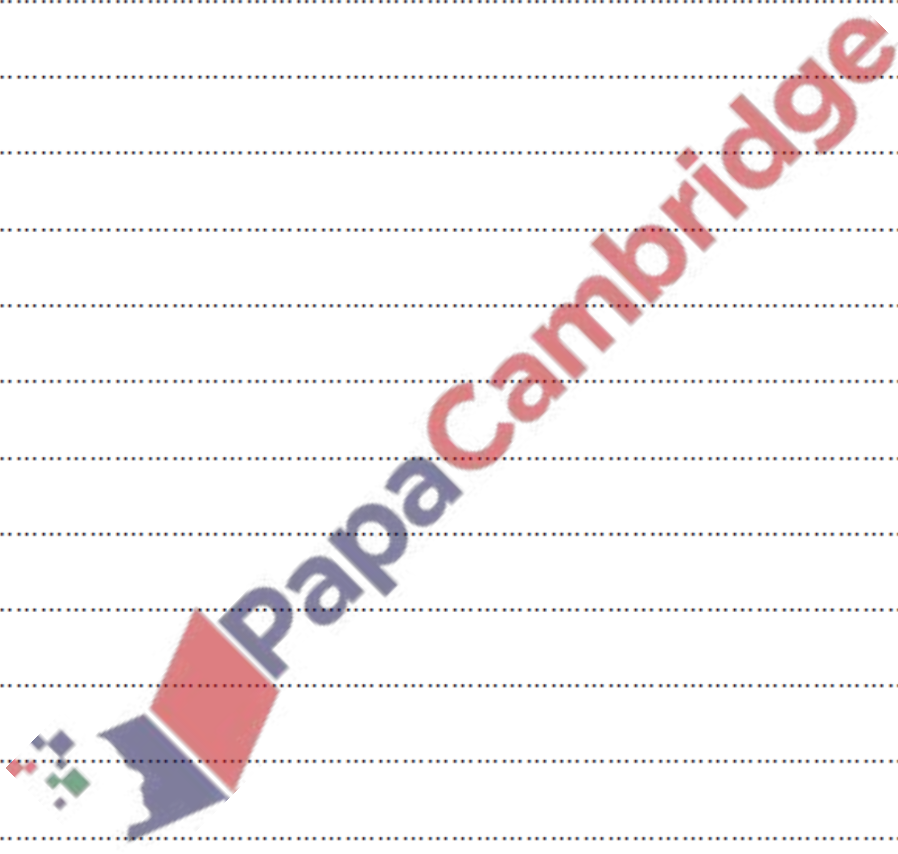
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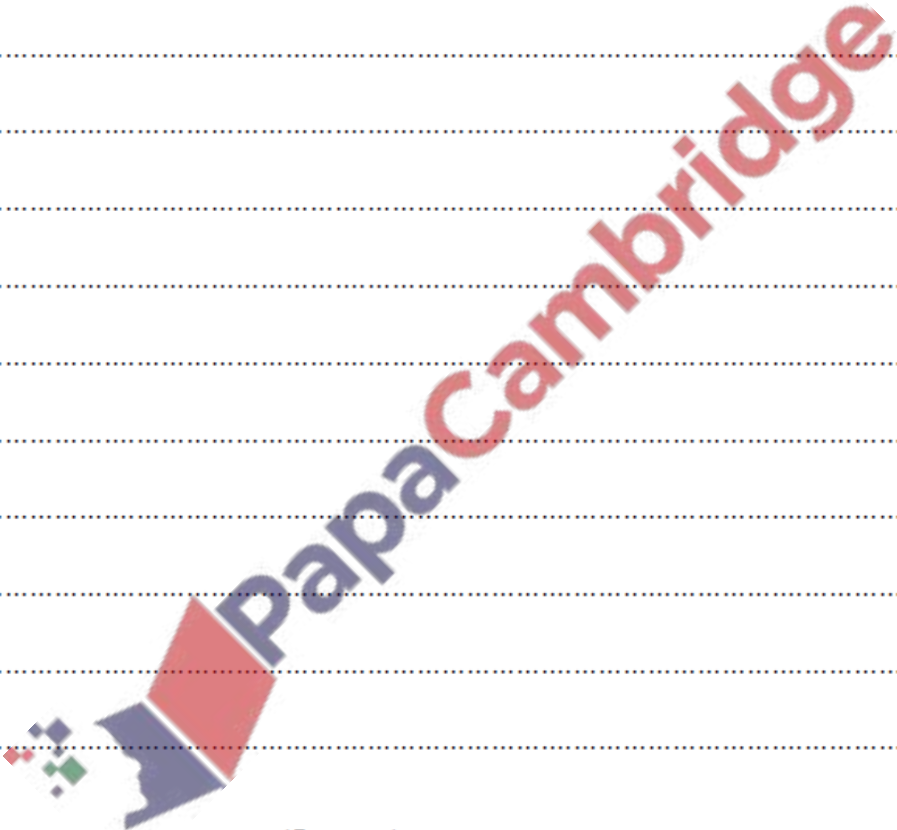


3. June/2023/Paper\_9709/22/No.6(a, b)

(a) Show that  $4 \sin\left(\theta + \frac{1}{3}\pi\right) \cos\left(\theta - \frac{1}{3}\pi\right) \equiv \sqrt{3} + 2 \sin 2\theta$ .

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(b) Find the exact value of  $4 \sin \frac{17}{24}\pi \cos \frac{1}{24}\pi$ .

[2]

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