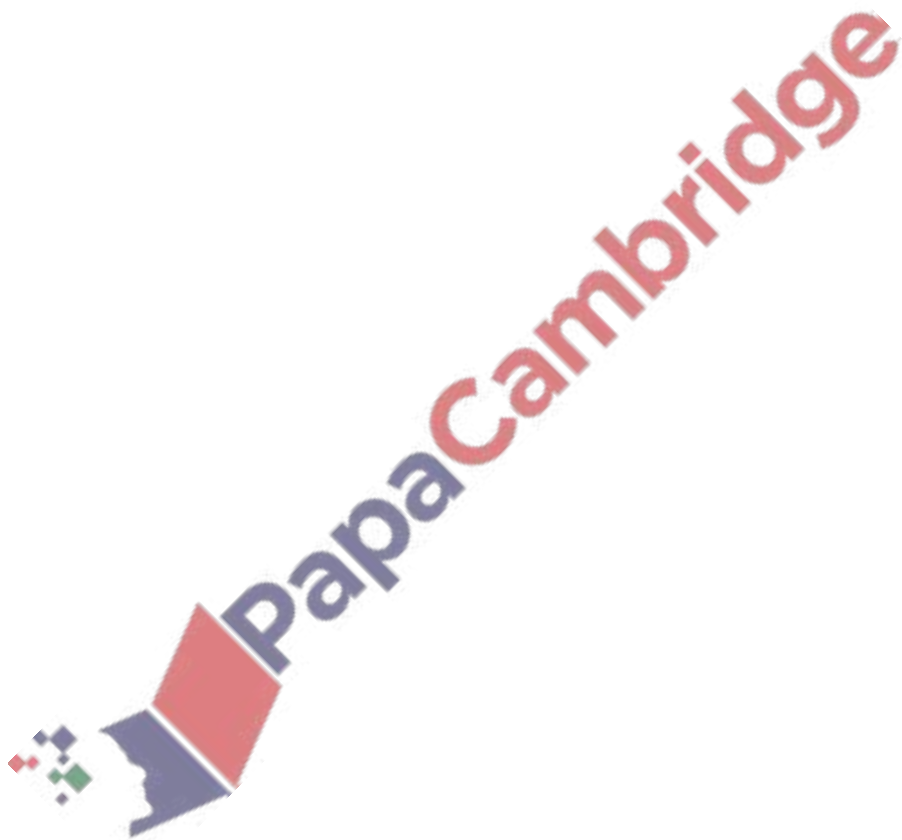


1. **Nov/2023/Paper\_9709/31/No.2**

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



The complex number  $u$  is defined by  $u = \frac{3 + 2i}{a - 5i}$ , where  $a$  is real.

- (a) Express  $u$  in the Cartesian form  $x + iy$ , where  $x$  and  $y$  are in terms of  $a$ . [3]

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- (b) Given that  $\arg u = \frac{1}{4}\pi$ , find the value of  $a$ . [2]

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- (a) On a sketch of an Argand diagram, shade the region whose points represent complex numbers  $z$  satisfying the inequalities  $|z - 4 - 3i| \leq 2$  and  $\text{Re } z \leq 3$ . [4]

- (b) Find the greatest value of  $\arg z$  for points in this region. [2]

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5. Nov/2023/Paper\_9709/33/No.2

On an Argand diagram, shade the region whose points represent complex numbers  $z$  satisfying the inequalities  $|z - 1 + 2i| \leq |z|$  and  $|z - 2| \leq 1$ . [5]

