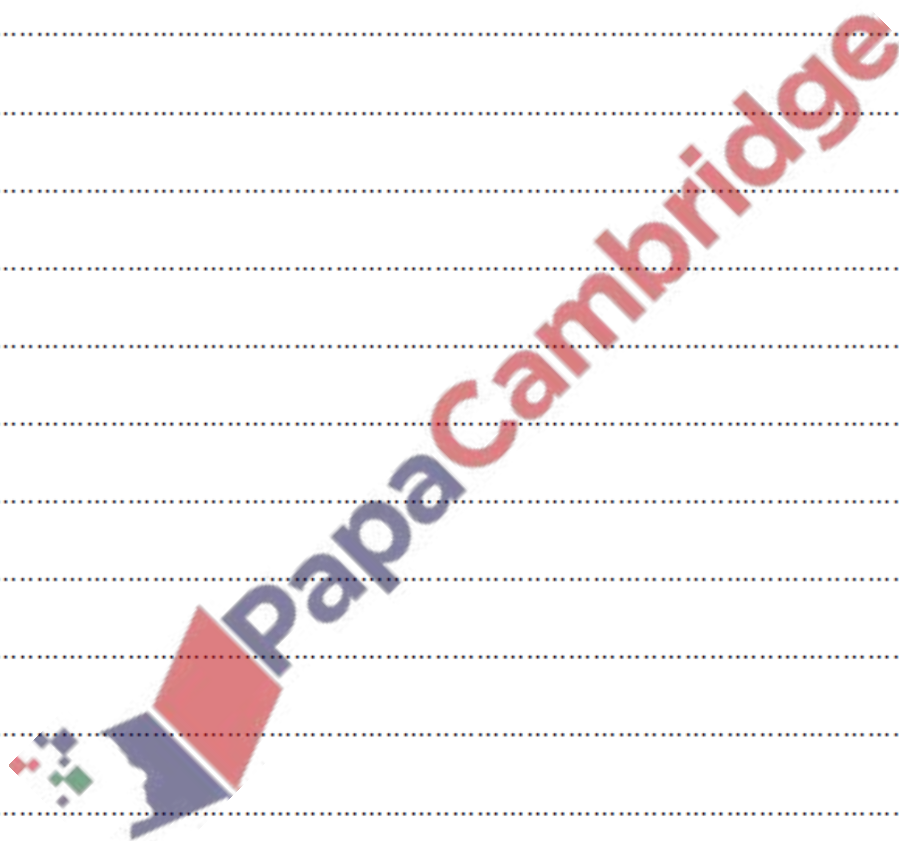


1. March/2022/Paper\_9709/22/No.1

Solve the equation  $|5x - 2| = |4x + 9|$ .

[3]



The polynomial  $p(x)$  is defined by

$$p(x) = 4x^3 + 16x^2 + 9x - 15.$$

- (a) Find the quotient when  $p(x)$  is divided by  $(2x + 3)$ , and show that the remainder is  $-6$ . [3]

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- (b) Find  $\int \frac{p(x)}{2x + 3} dx$ . [2]

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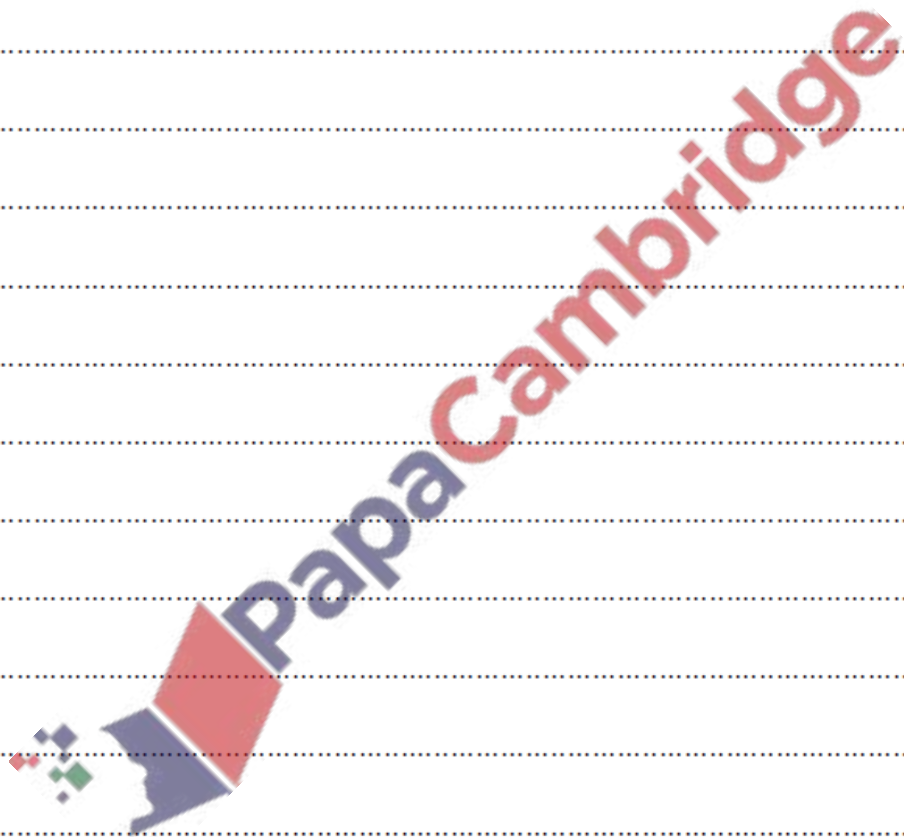
(c) Factorise  $p(x) + 6$  completely and hence solve the equation

$$p(\operatorname{cosec} 2\theta) + 6 = 0$$

for  $0^\circ < \theta < 135^\circ$ .

[5]

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The polynomial  $p(x)$  is defined by

$$p(x) = 2x^3 + 5x^2 + ax + 2a,$$

where  $a$  is an integer.

- (a) Find, in terms of  $x$  and  $a$ , the quotient when  $p(x)$  is divided by  $(x + 2)$ , and show that the remainder is 4. [3]

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- (b) It is given that  $\int_{-1}^1 \frac{p(x)}{x + 2} dx = \frac{22}{3} + \ln b$ , where  $b$  is an integer.

Find the values of  $a$  and  $b$ . [6]

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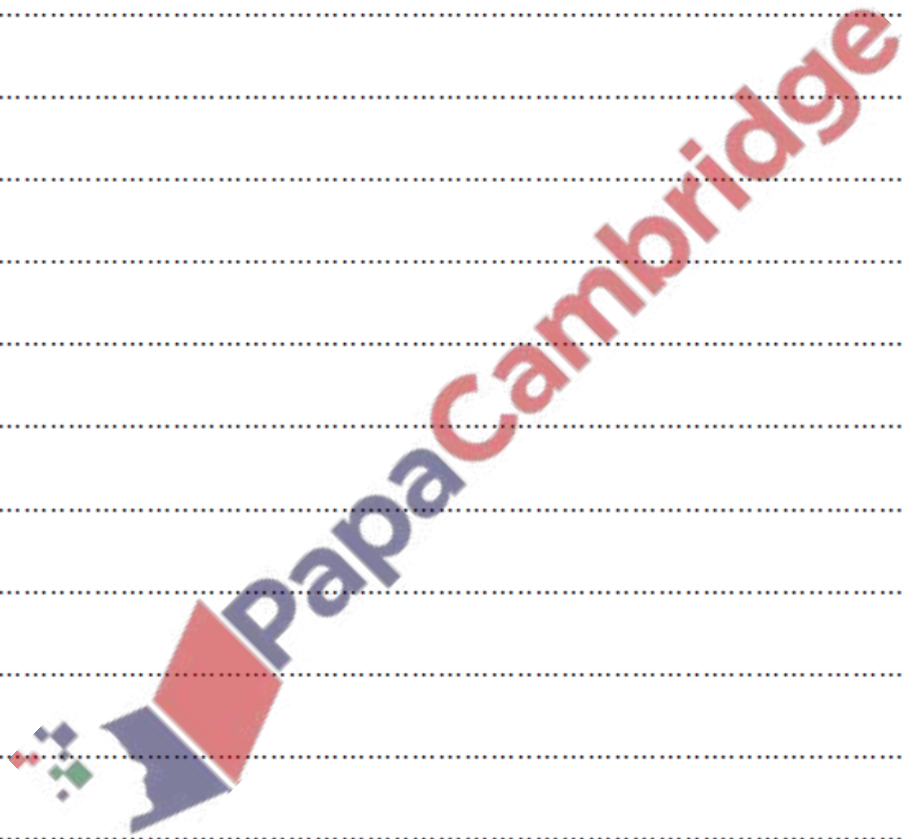
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(a) Sketch, on the same diagram, the graphs of  $y = |2x - 9|$  and  $y = 5x - 3$ .

[2]

(b) Solve the equation  $|2x - 9| = 5x - 3$ .

[2]



A large, diagonal watermark reading "PapaCambridge" in red and blue text is overlaid across the page. Below the watermark, there are ten horizontal dotted lines for writing the solution to part (b).

The polynomial  $p(x)$  is defined by

$$p(x) = 2x^3 + ax^2 - 3x - 4,$$

where  $a$  is a constant. It is given that  $(x - 4)$  is a factor of  $p(x)$ .

(a) Find the value of  $a$  and hence factorise  $p(x)$ .

[4]

