











4 The cubic equation  $2x^3 + 5x^2 - 6 = 0$  has roots  $\alpha, \beta, \gamma$ .

(a) Find a cubic equation whose roots are  $\frac{1}{\alpha^3}, \frac{1}{\beta^3}, \frac{1}{\gamma^3}$ . [3]

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(b) Find the value of  $\frac{1}{\alpha^6} + \frac{1}{\beta^6} + \frac{1}{\gamma^6}$ . [3]

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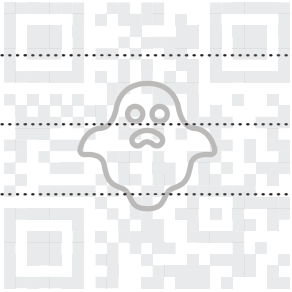
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(c) Sketch  $C$ , stating the coordinates of the intersections with the axes.

[3]

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(d) Sketch the curve with equation  $y = \left| \frac{2x^2 - x - 1}{x^2 + x + 1} \right|$  and state the set of values of  $k$  for which  $\left| \frac{2x^2 - x - 1}{x^2 + x + 1} \right| = k$  has 4 distinct real solutions.

[2]

