

Question Examples from Advance Information for Paper 3 (OCR MEI)

Inverse proportion graphs (the graph of $y=k/x$)

Fig. 9 shows the curves $y = \frac{1}{x+2}$ and $y = x^2 + 7x + 7$.

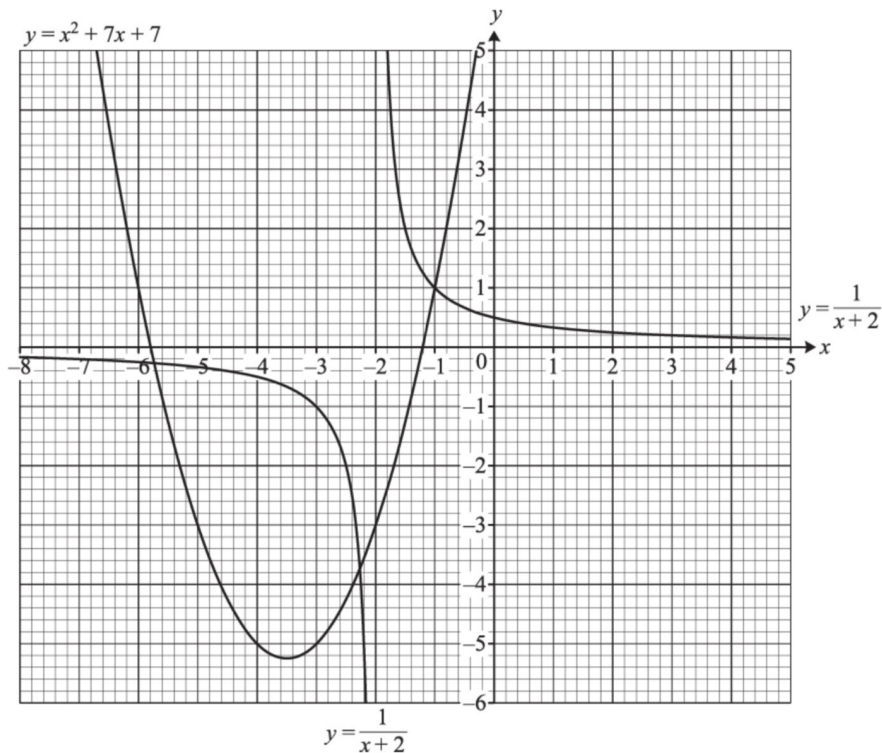


Fig.9

(i) Use Fig. 9 to estimate graphically the roots of the equation $\frac{1}{x+2} = x^2 + 7x + 7$.

[2]

(ii) Show that the equation in part (i) may be simplified to $x^3 + 9x^2 + 21x + 13 = 0$. Find algebraically the exact roots of this equation.

[7]

(iii) The curve $y = x^2 + 7x + 7$ is translated by $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$.

(A) Show graphically that the translated curve intersects the curve $y = \frac{1}{x+2}$ at only one point. Estimate the coordinates of this point.

[2]

(B) Find the equation of the translated curve, simplifying your answer.

[2]

The equation of a curve is $y = \frac{a}{(x+b)^2}$. Fig. 5 shows the curve for particular values of the constants a and b .

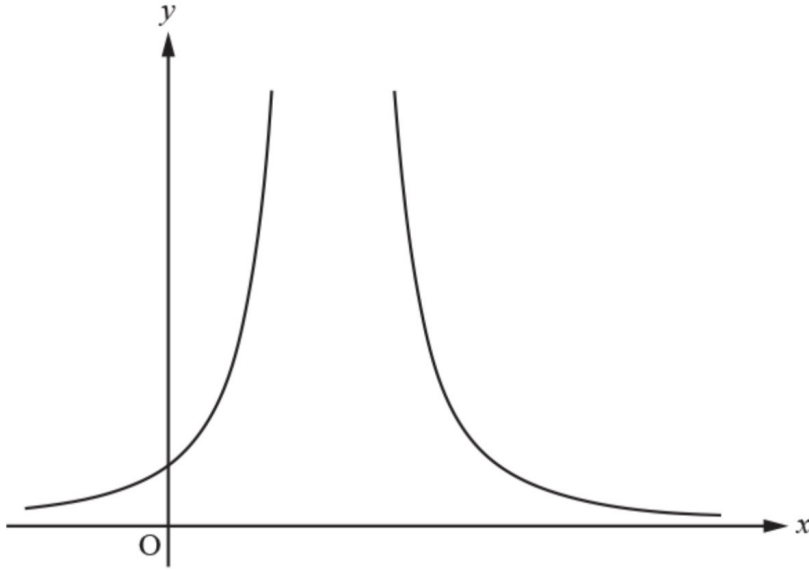


Fig. 5

- (a) Write down the equations of the asymptotes, in terms of a and/or b where necessary. [2]
- (b) Joe says "For all values of a and b , the curve lies above the x -axis." Determine whether Joe's statement is true or false. [2]
- (c) The curve goes through the points $(1, 3)$ and $(3, 3)$. Find the values of a and b . [4]

