Quadratic functions – 2022 Nov IGCSE 0606 Additional Math

1. Nov/2022/Paper_0606_12/No.2

The first three terms, in descending powers of x, of the expansion of $\left(ax+\frac{2}{5}\right)^5\left(1-\frac{b}{x}\right)^2$, can be written as $32x^5-160x^4+cx^3$, where a, b and c are constants. Find the exact values of a, b and c. [9]

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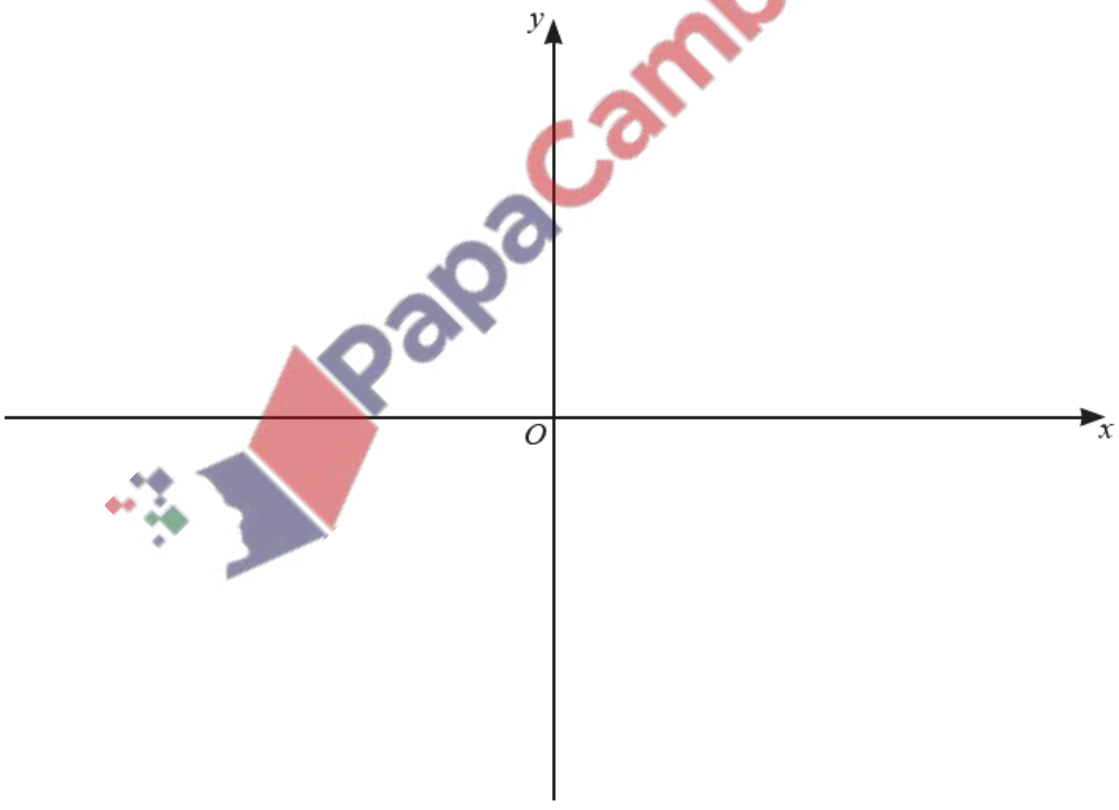
2. Nov/2022/Paper_0606_13/No.2

(a) Show that $2x^2+x-15$ can be written in the form $2(x+a)^2+b$, where a and b are exact constants to be found. [2]

(b) Hence write down the coordinates of the stationary point on the curve $y=2x^2+x-15$. [2]

(c) On the axes, sketch the graph of $y=|2x^2+x-15|$, stating the coordinates of the points where the graph meets the coordinate axes. [3]



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(d) Write down the value of the constant k for which the equation $|2x^2+x-15|=k$ has 3 distinct solutions. [1]

3. Nov/2022/Paper_0606_21/No.6

(a) Write $3x^2+15x-20$ in the form $a(x+b)^2+c$ where a, b and c are rational numbers. [4]

(b) State the minimum value of $3x^2+15x-20$ and the value of x at which it occurs. [2]

(c) Use your answer to **part (a)** to solve the equation $3y^{\frac{2}{3}}+15y^{\frac{1}{3}}-20=0$, giving your answers correct to three significant figures. [3]

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