

MEI Core 1 Quadratic Functions Questions Jan 05 - May 09

- 1**
- (i) Show that the graph of $y = x^2 - 3x + 11$ is above the x -axis for all values of x . [3]
- (ii) Find the set of values of x for which the graph of $y = 2x^2 + x - 10$ is above the x -axis. [4]
- (iii) Find algebraically the coordinates of the points of intersection of the graphs of
 $y = x^2 - 3x + 11$ and $y = 2x^2 + x - 10$. [5]
- 2**
- (i) Write $x^2 - 8x + 25$ in the form $(x - a)^2 + b$. [3]
- (ii) State the coordinates of the minimum point on the graph of $y = x^2 - 8x + 25$ and sketch this graph. [4]
- (iii) Solve the inequality $x^2 - 8x + 25 > 18$. [3]
- (iv) The graph of $y = x^2 - 8x + 25$ is translated by $\begin{pmatrix} 0 \\ -20 \end{pmatrix}$. State an equation for the resulting graph. [1]
- 3**
- (i) Write $x^2 - 7x + 6$ in the form $(x - a)^2 + b$. [3]
- (ii) State the coordinates of the minimum point on the graph of $y = x^2 - 7x + 6$. [2]
- (iii) Find the coordinates of the points where the graph of $y = x^2 - 7x + 6$ crosses the axes and sketch the graph. [5]
- (iv) Show that the graphs of $y = x^2 - 7x + 6$ and $y = x^2 - 3x + 4$ intersect only once. Find the x -coordinate of the point of intersection. [3]

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- 4** (i) Write $4x^2 - 24x + 27$ in the form $a(x - b)^2 + c$. [4]
- (ii) State the coordinates of the minimum point on the curve $y = 4x^2 - 24x + 27$. [2]
- (iii) Solve the equation $4x^2 - 24x + 27 = 0$. [3]
- (iv) Sketch the graph of the curve $y = 4x^2 - 24x + 27$. [3]
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- 5** (i) Write $x^2 - 5x + 8$ in the form $(x - a)^2 + b$ and hence show that $x^2 - 5x + 8 > 0$ for all values of x . [4]
- (ii) Sketch the graph of $y = x^2 - 5x + 8$, showing the coordinates of the turning point. [3]
- (iii) Find the set of values of x for which $x^2 - 5x + 8 > 14$. [3]
- (iv) If $f(x) = x^2 - 5x + 8$, does the graph of $y = f(x) - 10$ cross the x -axis? Show how you decide. [2]