



Name: _____ () Class: _____ Date: _____

Duration: 1 hour

Marks: 40

- Omission of essential working will result in loss of marks.
- The number of marks for each question or part question is shown in [].
- The use of calculators is allowed.

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- 1 The line $x + y = 3$ meets the curve $x^2 - 2x + 2y^2 = 3$ at two distinct points.
Find the coordinates of these two points. [4]
 - 2 Find the possible values of k for which the line $y = kx - 1$ does not intersect the curve $y = x^2 + 3$. [3]
 - 3 Using a suitable substitution, solve the equation $4^{x-1} + 16^x = 66$. [4]
 - 4 Sketch the graph of $y = 4x^2 - 24x + 20$, indicating clearly the coordinates of the turning point, x and y intercepts. [4]
 - 5 The area of a rectangle $ABCD$ is given by $(1 + 3\sqrt{2})\text{m}^2$, and the length of side AB is $(2 + \sqrt{8})\text{m}$.
Find, without using a calculator, the length of side BC in the form of $(a + b\sqrt{2})\text{m}$, where a and b are real numbers. [3]
 - 6 Given that $\frac{\sqrt{3}-1}{2\sqrt{3}+3} + \sqrt{48} - \frac{4}{\sqrt{3}}$ can be expressed in the form of $a + b\sqrt{3}$, find the value of a and of b . [4]
 - 7 Show that $4x^2 - 12x + 10$ is **always positive** for all real values of x . [3]
 - 8 Show that the roots of $x^2 + (p-2)x = 2p$ are real. [3]
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9 Solve the equation $\sqrt{25x-50} - \sqrt{x-2} = 12$. [3]

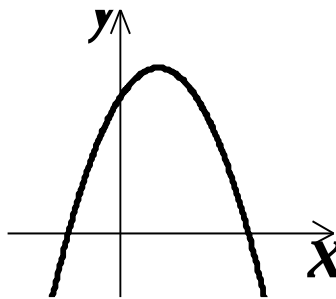
10 Find the solution set of each of the following inequalities:

(i) $x^2 > 3x + 18$ [2]

(ii) $(x+2)^2 < 9$ [2]

Hence, state the set of values of x which satisfy both of these inequalities. [1]

11 The given diagram shows a quadratic curve with a y -intercept of 48 which crosses the x -axis at $x = -4$ and $x = 6$.



(i) **State** the equation of the line of symmetry for the curve. [1]

(ii) Find the equation of the parabola in the form $y = ax^2 + bx + c$ where $a \neq 0$. [3]

Time yourself to finish in 1 hour!!

