



Name: _____ () Class: _____ Date: _____
Revision Paper 1

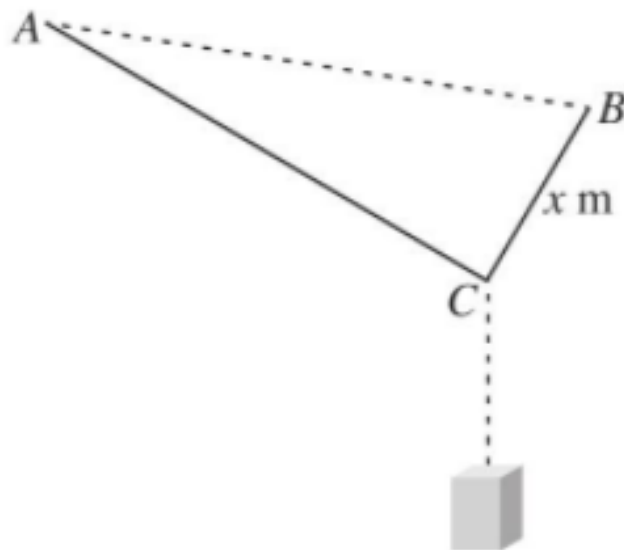
Term 1

Topics: Algebraic Manipulations/ Surds & Indices / Quadratic Expressions & Functions

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- Answer all questions.
 - 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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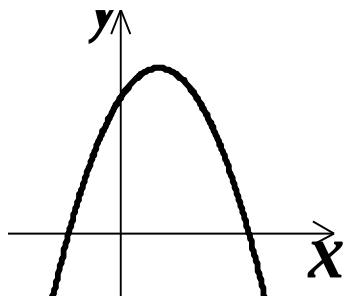
- 1 The line $x + y = 3$ meets the curve $x^2 - 2x + 2y^2 = 3$ at two distinct points. Find the coordinates of these two points. [4]
- 2 Find the possible values of k for which the line $y = kx - 1$ does not intersect the curve $y = x^2 + 3$. [3]
- 3 Using a suitable substitution, solve the equation $4^{x-1} + 16^x = 66$. [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 Factorise $x^4 - 3x^3 + 2x^2$ completely. [2]
- 6 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]
- 7 Simplify into a single fraction $\frac{x^3 + 8y^3}{x^2 - 4y^2} - \frac{16xy^2 - 4x^3}{(4y - 2x)^2}$. [3]

- 8 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]
- 9 Show that $4x^2 - 12x + 10$ is always positive for all real values of x . [3]
- 10 Show that the roots of $x^2 + (p-2)x = 2p$ are real. [3]
- 11 Solve the equation $\sqrt{25x-50} - \sqrt{x-2} = 12$. [3]
- 12 In an experiment, the ends of a string of length 8 m are attached to two points A and B . A weight is fixed to point C on the string. The two parts of the string, AC and BC , are both straight. The length of BC is x m.
- (i) Given that $AB = 7$ m and $\text{angle } ACB = 90^\circ$, form an equation in x and show that it reduces to $2x^2 - 16x + 15 = 0$. [2]
- (ii) Given that AC is longer than BC , find the value of x . [2]



- 13 Find the solution set of each of the following inequalities:
- (i) $x^2 > 3x + 18$ [2]
- (ii) $(x+2)^2 < 9$ [2]

- 14** 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]