



Name: _____ () Class: _____ Date: _____

Term 2 Additional Mathematics Test 1

Revision Paper 2

Answer all the questions.

- 1 (i) Express $-2x^2 + 12x - 7$ in the form $a(x - h)^2 + k$, where a , h and k are rational numbers. [3]
- (ii) Solve $-2x^2 + 12x - 7 = 0$, express your answers in the form $a + b\sqrt{22}$, where a and b are rational numbers. [2]
- (iii) Hence, sketch the graph $y = -2x^2 + 12x - 7$, indicate clearly the turning point, x and y -intercepts. [3]
- 2 Given that $\frac{a^x}{b^{3-x}} \times \frac{b^y}{(a^{y+1})^2} = ab^6$, find the value of x and of y . [4]
- 3 A cuboid has a square base of side $(2 - \sqrt{3})$ m and a height of h m. The volume of the cuboid is $(2\sqrt{3} - 3)$ m³. **Without using a calculator**, show that h can be expressed as $a + b\sqrt{3}$, where a and b are integers. [4]
- 4 Solve the equations.
- (a) $\sqrt{9 + 2x^2} = 3 + x$ [3]
- (b) $12(3^x) = 9^x + 27$ [3]
- 5 Solve the inequalities. Represent the solution sets on separate number lines.
- (i) $3(2 - x) \geq 2x + 11$, [2]
- (ii) $3(x^2 - 5) < x - 1$. [3]
- 6 The straight line $y = kx - 4$ where k is a constant and $k < 0$ is tangent to the curve $y = x^2 - kx - k^2$. Find the value(s) of k . [3]