|  |
| --- |
|  |
| **Topic** | Objectives | **☺** | **😐** | **☹** |
| Surds and indices | Use the laws of indices. |  |  |  |
| Understand that fractional powers correspond to roots. |  |  |  |
| Simplify surds and rationalise a denominator (when they have the form ). |  |  |  |
| **Assessment 1 % Grade** |
| Quadratics | Add, subtract and multiply polynomials. |  |  |  |
| Write a quadratic in completed square form. Use this form to identify the vertex of a quadratic and to sketch the graph. |  |  |  |
| Solve quadratic equations. |  |  |  |
| Use the discriminant of a quadratic to identify the number of roots. Solve problems involving the discriminant. |  |  |  |
| Solve equations in x which are quadratic in some function of x. |  |  |  |
| **Assessment 2 % Grade** |
| Simultaneous equations | Identify the coordinates of a point where two straight lines intersect (by solving a pair of simultaneous equations). |  |  |  |
| Solve by substitution a pair of simultaneous equations of which one is linear and one is quadratic. |  |  |  |
| **Assessment 3 % Grade** |
| Coordinate geometry. | Find the length, gradient and mid-point of a line-segment, given the coordinates of its endpoints. |  |  |  |
| Find the equation of a straight line given sufficient information (e.g. the coordinates of two points on it, or one point on it and its gradient); |  |  |  |
| Understand and use the relationships between the gradients of parallel and perpendicular lines. |  |  |  |
| Understand the relationship between a graph and its associated algebraic equation, use points of intersection of graphs to solve equations, and interpret geometrically the algebraic solution of equations (e.g. repeated roots). |  |  |  |
| **Assessment 4 % Grade** |
| **NOVEMBER TEST % Grade** |
| Inequalities | Solve a linear inequality. |  |  |  |
| Solve a quadratic inequality. |  |  |  |
| **Assessment 5 % Grade** |
| Differentiation. | Understand the gradient of a curve at a point as the limit of the gradients of a suitable sequence of chords. |  |  |  |
| Use the derivative of xn (for any rational n), together with constant multiples, sums and differences. |  |  |  |
| Apply differentiation to gradients, tangents and normals. |  |  |  |
| Apply differentiation to rates of change. |  |  |  |
| Apply differentiation to increasing and decreasing functions. |  |  |  |
| **Assessment 6 % Grade** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Topic** | Objectives | **☺** | **😐** | **☹** |
| Further differentiation | Calculate a second derivative. |  |  |  |
| Locate the position of maximum and minimum points. |  |  |  |
| **Assessment 7 % Grade** |
| Transforming graphs | Sketch curves with equations of the form (i) *y = kxn* , (ii) *y =k*√*x*, (iii) *y*=*ax*2+*bx+c*, (iv) *y* = f(*x*), where f(*x*) is the product of at most 3 linear factors. |  |  |  |
| Understand and use the relationships between the graphs of *y* = f(*x*) , *y* = *a*f(*x*) , *y* = f(*x*) + *a*, *y* = f(*x+a*) , *y* = f(*ax*) |  |  |  |
| **Assessment 8 % Grade** |
| Circle geometry | Understand that the equation (*x − a*)2 + (*y − b*)2 = *r*2 represents the circle with centre (*a,b*) and radius *r.* |  |  |  |
| Use algebraic methods to solve problems involving lines and circles, including the use of the equation of a circle in expanded form *x*2+*y*2+2*gx*+2*fy*+*c*=0.  |  |  |  |
| Knowledge of the following circle properties: the angle in a semicircle is a right angle; the perpendicular from the centre to a chord bisects the chord; the perpendicularity of radius and tangent. |  |  |  |
| **Assessment 9 % Grade** |
| **MOCK EXAMINATION** |