 The quadratic polynomial and the parabola

| Content | Teaching strategies and activities | Resources |
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| Problems involving the discriminant. | The discriminant – [The Discriminant in Quadratic Equation from the MathWarehouse website](http://www.mathwarehouse.com/quadratic/discriminant-in-quadratic-equation.php)Foldable discriminant – [The Disciminant – Foldable from the MathsLinks website](http://mathslinks.net/faculty/the-discriminant-foldable)The discriminant YouTube clip – [The Discriminant of a Quadratic: YOU DON’T NEED IT](https://www.youtube.com/watch?v=4IVoIuMsK0A) |  |
| Working with positive definite, negative definite, indefinite. |  |  |
| Problems involving sum and product of roots. | Formula for the sum and product of roots – [Formula page from the MathsWarehouse website](http://www.mathwarehouse.com/quadratic/roots/formula-sum-product-of-roots.php) |  |
| Problems involving Quadratic Identity Theorem. |  |  |
| Equations reducible to quadratics. | Equations reducible to quadratics – [YouTube clip titled ‘Algebra 2 Section 8.5 Equations Reducible to Quadratic Form’](https://www.youtube.com/watch?v=AAcknrC0QJA) and algebra notes, [‘Equations Reducible to Quadratic Form’ from Paul’s Online Maths Notes](http://tutorial.math.lamar.edu/Classes/Alg/ReducibleToQuadratic.aspx). |  |
|  |  | Quadratic Inequalities YouTube clip – [Quadratic inequalities (visual explanation) | Algebra II | Khan Academy](https://www.youtube.com/watch?v=xdiBjypYFRQ)Quadratic polynomial quiz – [AB Quizzes: Quadratic Polynomial – Basics from the MathsLinks website](http://mathslinks.net/faculty/ab-quizzes-quadratic-polynomial-basics) |
| Solving basic locus problems (circles, bisectors, etc.). | Introducing Locus – [exzuberant blogspot on Three teaching ideas for introducing locus](http://exzuberant.blogspot.com.au/2012/09/three-teaching-ideas-for-introducing.html)Desmos Demonstration – [interactive Focus/Directrix of parabola on the Desmos website](https://www.desmos.com/calculator/pvphegrumo)The equation of a circle – [The Equation of a Circle (Tanton Mathematics) YouTube clip](https://www.youtube.com/watch?v=IFPS05UosQk&feature=youtu.be) | Directrix and Focus of a parabola – [MathWarehouse website page on the Focus and Directrix of a Parabola](http://www.mathwarehouse.com/quadratic/parabola/focus-and-directrix-of-parabola.php) and [The Interactive Mathematics website – Parabola – Interactive Graphs](http://www.intmath.com/plane-analytic-geometry/parabola-interactive.php) |
| Locus description of a parabola and derivation of equation from the locus. | [An animation of creating a parabola](https://plus.google.com/u/0/117008945303447204098/posts/SzkKcbULfvL) |  |
| Four standards orientations of the parabola. | [Geogebra file showing the effects on a parabola’s orientation](https://www.geogebra.org/m/k2uCKzuN) |  |
| Translation of the parabola from vertex (0,0) to vertex (h,k) - in the four standard orientations. | Matching exercise in Desmos – [a Google doc on Parabola Matching Activity](https://docs.google.com/document/d/1dx1PEgvPnOPDAuW8JU_vPJy6b-PRDhzsvTQyArLb6N8/edit) |  |
| Problems converting between geometric and cartesian descriptions of the parabola with vertex at (h,k). | [Ten lessons on locus and parabola via the MathsLinks website](https://mathslinks.net/faculty/10-lessons-on-locus-and-parabola) |  |
| Resources. | Introducing locus – [exzuberant blogspot on Three teaching ideas for introducing locus](http://exzuberant.blogspot.com.au/2012/09/three-teaching-ideas-for-introducing.html) | Quadratic Polynomial Poster – [MathsLinks page on Mathematics (2U) Summary Posters](http://mathslinks.net/faculty/mathematics-2u-summary-posters) |
|  | How to create a parabola – [An animation of creating a parabola](https://plus.google.com/u/0/117008945303447204098/posts/SzkKcbULfvL) |  |
| Revision. | Desmos Lesson on Parabola – [Polygraph: Parabolas](https://teacher.desmos.com/polygraph-parabolas) | Summary posters – [MathsLinks page on Mathematics (2U) Summary Posters](http://mathslinks.net/faculty/mathematics-2u-summary-posters) |