# PiXL Personalised Learning Checklist

Partners in excellence

| | Red | Amber | Green | How do you know? |
|---|---|---|---|---|
| **-1. Roots of polynomials** | | | | |
| Appreciate the relationship between the roots and coefficients of quadratic, cubic and quartic equations. | | | | |
| **-2. Complex Numbers** | | | | |
| Know how to represent complex numbers and their conjugates on an Argand diagram. | | | | |
| Understand the polar and cartesian coordinate forms of a complex number. | | | | |
| Be able to calculate the modulus and argument of a complex number. | | | | |
| Be able to represent the sum and difference of two complex numbers on an Argand diagram. | | | | |
| Be able to represent the product and quotient of two complex numbers on an Argand diagram. | | | | |
| Be able to represent simple sets of complex numbers as loci in the Argand diagram. | | | | |
| **-3. De Moivre's Theorem** | | | | |
| Understand De Moivre's theorem. | | | | |
| Understand the definition e^j(θ) = cos(θ) + jsin(θ) and hence the form z = re^j(θ). | | | | |
| Be able to apply de Moivre's theorem to solving equations of the type Z^n = a + jb. | | | | |
| **-4. Proof by Induction** | | | | |
| Be able to construct and present a correct proof using mathematical induction. | | | | |
| **-5. Finite Series** | | | | |
| Be able to sum finite sequences using the method of differences. | | | | |
| **-6. The calculus of inverse trigonometric functions** | | | | |
| Be able to use the derivatives of the inverse trigonometric functions. | | | | |
| Recognise integrals of functions of the form ((x)^2 ± (a)^2)^-½, ((a)^2 - (x)^2)^-½ and ((a)^2 + (x)^2)^-1 and be able to integrate associated functions by using trigonometrical substitutions. | | | | |
| **-7. Hyperbolic functions** | | | | |
| Understand the definitions of hyperbolic functions and be able to sketch their graphs. | | | | |
| Be able to differentiate and integrate hyperbolic functions. | | | | |
| Understand and be able to use the definitions of the inverse hyperbolic functions. | | | | |
| Be able to use the logarithmic forms of the inverse hyperbolic functions. | | | | |
| Be able to use and prove basic hyperbolic function identities. | | | | |
| **-8. Arc length and area of surface of revolution about the x axis** | | | | |
| Be able to calculate the arc length of a curve using Cartesian or parametric coordinates. | | | | |
| Be able to calculate the area of a surface of revolution using Cartesian or parametric coordinates. | | | | |

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