"The Knowledge" – Vital facts to know off by heart

Discriminant and how it determines the number of roots of a quadratic

Quadratic formula

The factor theorem

Sine rule, cosine rule and area of a triangle

Equation of a circle

Graphs of sin, cos and tan (in both degrees and radians)

Special values of sin, cos and tan (in both degrees and radians)

Trigonometric identity for $tan \quad \theta$, the "Pythagorean" identity, and the two that derive from this

Laws of logarithms

Graphs of $y = x^2$, $y = x^3$, $y = \frac{1}{x}$, $y = \sqrt{x}$, $y = a^x$, $y = log_a x$

How to determine the nature of stationary points from $\frac{d^2y}{dx^2}$

Definitions of concave upwards and concave downwards

Derivatives of $y = x^n$ and $y = e^{kx}$

Graph transformations$y = f(x) + a$, $y = f(x + a)$, $y = af(x)$, $y = f(ax)$, $y = -f(x)$, $y = f(-x)$

The 5 constant acceleration formulae (SUVAT)

Special sums

$|wz|$ and $arg(wz)$ in terms of $|w|$, $|z|$, $arg(w)$, $arg(z)$

Modulus-argument form for a complex number with modulus r and argument θ

Complex loci for the forms $|z - \alpha| = r$, $\arg(z - \alpha) = \theta$ and $|z - \alpha| = |z - \beta|$

Arc length and area of sector formulae given angle in radians

nth terms and partial sums of arithmetic and geometric sequences (and sum to infinity)

Small angle approximations for $y = \sin\theta$, $y = \cos\theta$ and $y = \tan\theta$

Standard matrix transformations

Inverse and determinant of 2x2 matrices, and geometric significance of determinant

Roots of polynomials for quadratics, cubics, quartics (sums, products etc.)

Double angle formulae - $sin(2\theta)$, $cos(2\theta)$ (in 3 different ways) and $tan(2\theta)$