What you should already know...

• Derivative (slope of a curve) - what they are and how to calculate them (especially powers, exponential and trig functions)

• Integral (area under a curve) - what they are and how to calculate them (especially powers, exponential and trig functions; tricks for evaluating integrals - integration by parts, substitutions, partial fractions)

• Solution of a quadratic; an $n^{th}-$order polynomial has n roots

• Complex numbers: simple algebraic manipulation (*e.g.* if $z_1 = x_1 + \mathrm{i}y_1$ and $z_2 = x_2 + \mathrm{i}y_2$, what are $z_1 + z_2 =?$ and $z_1 z_2 =?$), Euler's formula ($e^{\mathrm{i}\theta} = \cos\theta + \mathrm{i}\sin\theta$), absolute value and argument ($z = x + \mathrm{i}y = re^{\mathrm{i}\theta}$, with $r = |z| = \sqrt{x^2 + y^2}$ being the absolute value and $\theta = \tan^{-1}(y, x)$ being the argument or phase)

• Matrices and vectors - what they are and how to calculate them (matrix inverse, determinant and eigenvalues/eigenvectors)

• Draw curves of simple functions (helpful guidelines: determine if always increasing or decreasing; look at limits for big or small argument; values at sample or special values; identify and locate any extrema)

• Trig functions and formulae (the sine, cosine and tan functions; at least be aware that helpful trig formulae exist to assist algebraic manupilations; *e.g.*

$$\sin 0 = \sin\pi = 0, \quad \sin(\pi/2) = 1 = -\sin(3\pi/2),$$

$$\cos 0 = -\cos\pi = 1, \quad \cos(\pi/2) = \cos(3\pi/2) = 0,$$

$$\sin(-A) = -\sin A, \quad \cos(-A) = \cos A, \quad \sin^2 A + \cos^2 A = 1,$$

$$\sin(2A) = 2\sin A\cos A, \quad \sin(A+B) = \sin A\cos B + \cos A\sin B,$$

$$\cos(2A) = \cos^2 A - \sin^2 A, \quad \cos(A+B) = \cos A\cos B - \sin A\sin B,$$

and many more...)

• Your professor makes lots of helpful algebraic mistakes and clever typographic errors that are carefully designed to assist your learning experience.