Chain Rule	Product Rule
Quotient Rule	Parametric Differentiation 1^{st} Derivative
Parametric Differentiation 2^{nd} derivative	Parametric Differentiation Speed
Derivative of an Inverse Function	

$$h(x) = f(x)g(x)$$

$$h'(x) = f'(x)g(x) + f(x)g'(x)$$

$$\frac{d}{dx}(f\big(g(x)\big) = f'\big(g(x)\big).\,g'(x)$$

$$\frac{dy}{dx} = \frac{{}^{dy}/_{dt}}{{}^{dx}/_{dt}}$$

$$h(x) = \frac{f(x)}{g(x)}$$

$$h'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2}$$

$$speed = \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}$$

$$\frac{d^2y}{dx^2} = \frac{y''x' - y'x''}{(x')^3}$$

$$\frac{d}{dx}\big(f^{-1}(x)\big) = \frac{1}{f'(f^{-1}(x))}$$

Volume of Revolution about the x-axis between the lines $x = b$ and $x = a$	Volume of Revolution about the y-axis between the lines $y = b$ and $y = a$
Integration by Parts	Rectilinear Motion Displacement (x)
Rectilinear Motion Velocity (v)	Rectilinear Motion Acceleration (a)
Integration $\int \frac{f'(x)}{f(x)} dx =$	Integration $\int f'(x)f(x)dx =$

$V = \int_a^b \pi x^2 \, dy$	$V = \int_a^b \pi y^2 \, dx$
$x = \int v \;\; dt$	$\int f \, g' = f \, g - \int f' g$
$a = \frac{dv}{dt}$	$v = \frac{ds}{dt}$ $v = \int a \;\; dt$
$\frac{1}{2}(f(x))^2 + c$	$\ln\lvert f(x)\rvert + c$

$\sec x =$	$\operatorname{cosec} x =$
$\cot x =$	
Matrices INCONSISTENT	Matrices REDUNDANT
Matrices ILL-CONDITIONED	

$\frac{1}{\sin x}$	$\frac{1}{\cos x}$
	$\frac{1}{\tan x}$
$\begin{pmatrix}1 & 2 & 2 & 11\\0 & -3 & 1 & -3\\0 & 0 & 0 & 0\end{pmatrix}$ From row 3 we can see that this equations is REDUNDANT i.e. there is an infinite number of solutions.	$\begin{pmatrix}1 & 2 & 2 & 11\\0 & -5 & -3 & -14\\0 & 0 & 0 & -1\end{pmatrix}$ From row 3 we can see that this equations is INCONSISTENT i.e. there are NO solutions.
	This occurs when a SMALL change in the coefficients of the equations leads to a LARGE change in the solutions.

Complex Numbers Complex Conjugate of $z = x + iy$	Complex Numbers Polar Form Modulus
Complex Numbers Polar Form Arguement	Complex Numbers De Moivre' Theorem
Partial Fractions Distinct Linear Factors	Partial Fractions Repeated Linear Factor
Partial Fractions Irreducible Quadratic Factor	

Modulus

$$r = \sqrt{x^2 + y^2}$$

$$z = x - iy$$

$$z = r(\cos\theta + i\sin\theta)$$

$$z^n = r^n(\cos n\theta + i\sin n\theta)$$

Argument

$$\theta = \tan^{-1}\frac{y}{x}$$

$$\frac{f(x)}{(x+a)(x+b)^2} = \frac{A}{(x+a)} + \frac{B}{(x+b)} + \frac{C}{(x+b)^2}$$

$$\frac{f(x)}{(x+a)(x+b)} = \frac{A}{(x+a)} + \frac{B}{(x+b)}$$

$$\frac{f(x)}{(x+a)(x^2+bx+c)} = \frac{A}{(x+a)} + \frac{Bx+C}{(x^2+bx+c)}$$

Matrices Determinant 2×2	Matrices Determinant 3×3
Matrices Transpose of a Matrix	Transformation Matrix Reflection in the x-axis
Transformation Matrix Reflection in the y-axis	Transformation Matrix Reflection in the *origin*
Transformation Matrix Reflection in line $y = x$	Transformation Matrix Reflection in the line through O which makes an angle of θ with the x-axis.

$A = \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$ $\det A = a\begin{vmatrix} e & f \\ h & i \end{vmatrix} - b\begin{vmatrix} d & f \\ g & i \end{vmatrix} + c\begin{vmatrix} d & e \\ g & h \end{vmatrix}$	$A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ $\det A = ad - bc$
$\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	Interchange the rows and columns. $A = \begin{pmatrix} a & b & c \\ d & e & f \end{pmatrix}$ $A' = \begin{pmatrix} a & d \\ b & e \\ c & f \end{pmatrix}$
$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$	$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$
$\begin{pmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

Transformation Matrix Rotation through $\theta°$ in an anti-clockwise direction.	
Vectors Direction Ratios	Vectors Direction Cosines
Vectors Vector Product	Vectors Scalar Triple Product

$$\begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$$

$$\underline{a} = \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

direction cosines $\frac{a_1}{|\underline{a}|} : \frac{a_2}{|\underline{a}|} : \frac{a_3}{|\underline{a}|}$

$$\underline{a} = \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

direction ratio $a_1 : a_2 : a_3$

$$\underline{a} \,.\, (\underline{b} \times \underline{c}) = \begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix}$$

$$\underline{a} = \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix} \quad \underline{b} = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$$

$$\underline{a} \times \underline{b} = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$$

$$= \underline{i}\begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} - \underline{j}\begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} + \underline{k}\begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix}$$

Differential Equations Variable Separable	Differential Equations First Order Linear
Second Order Differential Equations Auxiliary Equation Roots - Real & Distinct	Second Order Differential Equations Auxiliary Equation Roots - Real & Equal
Second Order Differential Equations Auxiliary Equation Roots - Complex	
Odd Functions	Even Functions

$$\frac{dy}{dx} + P(x)y = Q(x)$$

$$I(x) = e^{\int P(x)dx}$$

$$I(x)y = \int I(x)\,Q(x)\,dx$$

$$\frac{dy}{dx} = f(x)g(y)$$

$$\int \frac{dy}{g(y)} = \int f(x)dx$$

Complementary Function

$$y = Ae^{mx} + Bxe^{mx}$$

Complementary Function

$$y = Ae^{m_1x} + Be^{m_2x}$$

Complementary Function

$$y = e^{px}(A\cos qx + B\sin qx)$$

$$f(-x) = f(x)$$

$$f(-x) = -f(x)$$

Nature of Stationary Points $$\frac{d^2y}{dx^2} < 0$$	Nature of Stationary Points $$\frac{d^2y}{dx^2} > 0$$
Nature of Stationary Points $$\frac{d^2y}{dx^2} = 0$$	
Concavity Concave Upwards	Concavity Concave Downwards
Arithmetic Sequence n^{th} term	Arithmetic Series sum of 1^{st} n terms

Minimum Turning Point	Maximum Turning Point
	Use a Nature Table
$f''(x) < 0$	$f''(x) > 0$
$S_n = \frac{n}{2}(2a + (n-1)d)$	$U_n = a + (n-1)d$

Geometic Sequence n^{th} term	Geometric Series sum of 1^{st} n terms
Geometric Series sum to infinity	Pascal's Triangle
Binomial Theorem	Binomial Coefficient

$S_n = \frac{a(1-r^n)}{1-r}$	$U_n = ar^{(n-1)}$
1 1 1 1 2 1 1 3 3 1 1 4 6 4 1	if -1 < r < 1 then $S_\infty = \frac{a}{1-r}$
${}^nC_r = \frac{n!}{r!(n-r)!} = \binom{n}{r}$	$(x+y)^n = \sum_{r=0}^{r=n} \binom{n}{r} x^{n-r} \ y^r$