Formula for Arclength (Function notation) $y = f(x)$	**Formula for Arclength or Distance travelled (Parametric)**
Formula for Speed (Parametric)	**Formula for Slope (Parametric)**
Integration by Parts	**Formula for Area (Polar)**
What is the name of the shortcut that we use in place of Integration by Parts?	**What is my first step in this problem?** $\int \frac{4x^2+2}{x^2-7}\,dx$

$L=\int_a^b \sqrt{\left(\frac{dx}{dt}\right)^2+\left(\frac{dy}{dt}\right)^2}\,dt$	$L=\int_a^b \sqrt{1+\left(f'(x)\right)^2}\,dx$
$\frac{dy/dt}{dx/dt}=\frac{dy}{dx}=slope$	$Speed=\sqrt{\left(\frac{dx}{dt}\right)^2+\left(\frac{dy}{dt}\right)^2}$
$A=\frac{1}{2}\cdot\int_a^b r^2\,d\theta$	$\int u\,dv = \quad uv-\int v\,du$
Long Division	**Tabular method**

Which technique is used to solve this problem? $\int \frac{8}{(x-4)(x+3)}\,dx$	**Which technique is used to solve this problem?** $\int \ln x\,dx$
Which technique is used to solve this problem? $\int x\sqrt{x^2+3}\,dx$	**Formula for Euler's Method**
What is my first step in this problem $\frac{dy}{dx}=4xy$ **if looking for original equation?**	**What is L'Hopital's Rule?**
When does L'Hopital's Rule apply?	**What is Taylor's theorem for approximating f(x) to the nth term?**

Integration by Parts	**Partial Fractions**
$New\ y = Old\ y + dx \cdot \frac{dy}{dx}$ dx: *change in x* $\frac{dy}{dx}$ = Derivative (slope) at the point.	**Substitution**
$\lim_{x \to a} \frac{f(x)}{g(x)} = \lim_{x \to a} \frac{f'(x)}{g'(x)}$	**Separate the variables**
$f(x) = f(c) + \frac{f'(c)}{1!}(x-c) + \frac{f''(c)}{2!}(x-c)^2 + \ldots\ldots + \frac{f^n(c)}{n!}(x-c)^n$	If the limit is of the form $\frac{0}{0}$ or $\frac{\infty}{\infty}$.

MacLaurin Series are centered at …	**The MacLaurin Series for e^x is….**
The MacLaurin Series for $\sin x$ is….	**The MacLaurin Series for $\cos x$ is….**
Formulas for Hooke's Law	**Formulas for Logistical Growth**
Area as a limit	$\int_1^{\infty} \frac{1}{x^2}\,dx$ is called an .....

Series for e^x : $= 1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+$	$c=0$
Series for $\cos x$: $= 1-\frac{x^2}{2!}+\frac{x^4}{4!}-...$	Series for $\sin x$: $= x-\frac{x^3}{3!}+\frac{x^5}{5!}-...$
$\frac{dy}{dt}=ky\left(1-\frac{y}{L}\right)$; $y=\frac{L}{1+be^{-kt}}$; $b=\frac{L-Y_0}{Y_0}$ where L is the carrying capacity and k is the constant of proportionality	The force F required to compress a spring is proportional to the distance d the spring is compressed or stretched from its' original length. $F=kd$ $W=\int_a^b k\,x\,dx$ $k=$ constant of proportionality
Improper Integral	$\text{Area}=\lim_{n\to\infty}\sum_{i=1}^{n} f\left(a+\frac{b-a}{n}i\right)\left(\frac{b-a}{n}\right)$ height width $i=$ interval

Tell whether this series is convergent or divergent and why? $\sum_{n=1}^{\infty} \frac{1}{n} - \frac{1}{n+1}$	**Tell whether this series is convergent or divergent and why?** $\sum_{n=1}^{\infty} \frac{(-1)^n 7^n}{5^n}$
Tell whether this series is convergent or divergent and why? $\sum_{n=1}^{\infty} \frac{(-1)^n n!}{e^n}$	**Tell whether this series is convergent or divergent and why?** $\sum_{n=1}^{\infty} \frac{(-1)^n}{n+1}$
Tell whether this series is convergent or divergent and why? $\sum_{n=2}^{\infty} \frac{n^3+2}{n^3-5}$	**Tell whether this series is convergent or divergent and why?** $\sum_{n=1}^{\infty} \frac{1}{n^{1.4}}$
Tell whether this series is convergent or divergent and why? $\sum_{n=1}^{\infty} 5\left(\frac{2}{3}\right)^n$	**The MacLaurin Series for** $\frac{1}{1-x}$ **is……..**

Diverges by Root Test	**Converges by Telescoping Series**
Converges by Alternating Series	**Diverges by Ratio Test**
Converges by p-series	**Diverges by nth-term Test**
Series for $\frac{1}{1-x}$: $= 1+x+x^2+x^3...$	**Converges by Geometric series**