$\frac{dy}{dx} = f'(x)g(x) + g'(x)f(x)$	$\frac{dy}{dx} = \frac{f'(x)g(x) - g'(x)f(x)}{\left(g(x)\right)^2}$
$\frac{dy}{dx} = f'\left(g(x)\right) \cdot g'(x)$	$-\sin x$
$\cos x$	$\sec^2 x$
$-\csc x \cot$	$\sec x \tan x$

Quotient Rule $y=\frac{f(x)}{g(x)}$	Product Rule $y=f(x)\cdot g(x)$
$\frac{d}{dx}\cos x$	Chain Rule $y=f\left(g(x)\right)$
$\frac{d}{dx}\tan x$	$\frac{d}{dx}\sin x$
$\frac{d}{dx}\sec x$	$\frac{d}{dx}\csc x$

$-\csc^2 x$	$\frac{1}{f(x)} \cdot f'(x)$
$a^{f(x)} \cdot f'(x) \cdot ln\, a$	$\frac{dy}{dx} = f(x)^{g(x)}\left(g'(x)\ln f(x) + \frac{f'(x)}{f(x)} g(x)\right)$
$\frac{1}{1+\left(f(x)\right)^2} \cdot f'(x)$	$\frac{1}{\sqrt{1-\left(f(x)\right)^2}} \cdot f'(x)$
$ax + C$	$\frac{1}{\lvert f(x)\rvert\sqrt{\left(f(x)\right)^2 - 1}} \cdot f'(x)$

$\frac{d}{dx} ln\left(f(x)\right)$	$\frac{d}{dx}\cot x$
$\frac{d}{dx} f(x)^{g(x)}$	$\frac{d}{dx} a^{f(x)}$ where "a" is a constant
$\frac{d}{dx}\arcsin f(x)$	$\frac{d}{dx}\arctan f(x)$
$\frac{d}{dx}\operatorname{arcsec} f(x)$	$\int a\, dx$ where "a" is a constant

$\frac{x^{a+1}}{a+1}+ C$	$\frac{a^x}{1\cdot ln a}+C$
$=\sin x+C$	$=-\cos x+C$
$=\ln\lvert \sin x \rvert+C$	$=-\ln\lvert \cos x \rvert+C$
$=\ln\lvert \sec x+\tan x \rvert+C$	$=-\ln\lvert \csc x+\cot x \rvert+C$

$\int a^x \, dx$ where "a" is a constant	$\int x^a \, dx =$ where "a" is a constant
$\int \sin x \, dx =$	$\int \cos x \, dx =$
$\int \tan x \, dx =$	$\int \cot x \, dx =$
$\int \csc x \, dx =$	$\int \sec x \, dx =$

$\arcsin\frac{x}{a}+C$	$=ln\left\|f(x)\right\|+C$
$\frac{1}{a}\text{arcsec}\frac{\|x\|}{a}+C$	$\frac{1}{a}\arctan\frac{x}{a}+C$
$c-\frac{f(c)}{f'(c)}$	$\frac{1}{b-a}\cdot\int_a^b f(x)\,dx$
$\int_a^b\left\|v(t)\right\|\,dt$	$v(t)=0$

$\int \frac{f'(x)}{f(x)}\,dx =$	$\int \frac{1}{\sqrt{a^2 - x^2}}\,dx =$ where "a" is a constant
$\int \frac{1}{a^2 + x^2}\,dx =$ where "a" is a constant	$\int \frac{1}{x\sqrt{x^2 - a^2}}\,dx =$ where "a" is a constant
Average Value	**Newton's Method**
A particle is at rest when.....	Formula for distance traveled is ...

acceleration	velocity
$v(t)<0$	$v(t)>0$
$f'(c)=\dfrac{f(b)-f(a)}{b-a}$	$\dfrac{1}{b-a}\cdot\int_a^b v(t)\,dt$
$2\sin x\cos x$	$y=Ce^{kt}$

derivative of position = ...	derivative of velocity = ...
A particle is moving to the right or up when	A particle is moving to the left or down when ......
Formula for the average velocity of a particle......	**Mean-Value Theorem**
Growth Formula	Identity of $\sin 2x =$

$\cos^2 x - \sin^2 x$	$\frac{1-\cos 2x}{2}$
$\frac{1+\cos 2x}{2}$	$V = \pi\int_a^b \left[(\text{top function})^2 - (\text{bottom function})^2\right] dx$
$V = 2\pi\int_a^b x\left[(\text{top function}) - (\text{bottom function})\right] dx$	**Horizontal Tangents** **Maximum, minimum**
Concave up	**Inflection points**

Half-Angle Identity of $\sin^2 x =$	Identity of $\cos 2x =$
Formula for Volume rotated about x-axis (vertical cross sections)	Half-Angle Identity of $\cos^2 x =$
What does $f'(x)=0$ find?	**Formula for Volume rotated about y-axis (vertical cross sections)**
What does $f''(x)=0$ find?	$f''(x)>0$ means a graph is...

Increasing	**Concave down**
The endpoints and any maximum or minimum points on the interval.	**Decreasing**
Take an integral.	**Take a derivative.**
$\text{Avg. acceleration} = \frac{1}{b-a} \cdot \int_a^b a(t)\,dt$	$\text{Avg. velocity} = \frac{1}{b-a} \cdot \int_a^b v(t)\,dt$

$f''(x) < 0$ means a graph is...	$f'(x) > 0$ means a graph is...
$f'(x) < 0$ means a graph is...	**To find an absolute maximum or minimum on an interval we must check…..**
How do you find a rate of change?	**How do you find Area/Volume?**
How do you find average velocity v(t)?	**How do you find average acceleration a(t)?**

$V=\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$	$V=\frac{\sqrt{3}}{4}\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$
$V=\frac{\pi}{8}\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$	$V=10\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$
$V=\frac{1}{2}\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$	$V=\frac{1}{4}\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$
$V=2\cdot\tan\frac{3\pi}{8}\cdot\int_a^b(\text{top eq.}-\text{bottom eq.})^2\,dx$	$V=\frac{3\sqrt{3}}{2}\cdot\int_a^b(\text{top equation}-\text{bottom equation})^2\,dx$

Find Volume if known cross section is an Equilateral triangle.	**Find Volume if known cross section is a Square.**
Find Volume if known cross section is a Rectangle whose height is 10 times its' base .	**Find Volume if known cross section is a Semicircle.**
Find Volume if known cross section is a 45-45-90 triangle whose hypotenuse is the base .	**Find Volume if known cross section is a 45-45-90 triangle whose leg is the base .**
Find Volume if known cross section is a Regular Hexagon .	**Find Volume if known cross section is a Regular Octagon .**