Trigonometry

$\cos(A-B) = \cos A\cos B + \sin A\sin B$

$\cos(A+B) = \cos A\cos B - \sin A\sin B$

$\sin(A+B) = \sin A\cos B + \sin B\cos A$

$\sin(A-B) = \sin A\cos B - \cos A\sin B$

$\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A\tan B}$

$\tan(A-B) = \dfrac{\tan A - \tan B}{1 + \tan A\tan B}$

$\sin(2A) = 2\sin A\cos A$

$\cos(2A) = \cos^2 A - \sin^2 A$

$\tan(2A) = \dfrac{2\tan A}{1 - \tan^2 A}$

$\tan^{-1}\infty = \dfrac{\pi}{2}$

$1 + \tan^2 A = \sec^2 A$

$1 + \cot^2 A = \operatorname{cosec}^2 A$

$R\sin(\theta + \alpha)$ or $R\cos(\theta + \alpha)$

$R = \sqrt{a^2 + b^2}$ → $11\sin\theta + 5\sqrt{3}\cos\theta$ (a, b)

$\tan\alpha = \dfrac{\sin\alpha}{\cos\alpha}$

$1 + \cos\theta = 2\cos^2\left(\frac{\theta}{2}\right)$

$1 - \cos\theta = 2\sin^2\left(\frac{\theta}{2}\right)$

$\sin^2 x = \dfrac{1 - \cos 2x}{2}$

$\cos^2 x = \dfrac{1 + \cos 2x}{2}$

Differentiation

Product Rule: $vu' + uv'$

Quotient Rule: $\dfrac{vu' - uv'}{v^2}$

$\dfrac{d}{dx} e^x = e^x$

$\dfrac{d}{dx} e^{ax+b} = ae^{ax+b}$

$\dfrac{d}{dx} \ln(x) = \dfrac{1}{x}$

$\dfrac{d}{dx} A\ln(ax+b) = \dfrac{A}{ax+b}$ or $\dfrac{f'(x)}{f(x)}$

$\dfrac{d}{dx} \sin x = \cos x$

$\dfrac{d}{dx} \cos x = -\sin x$

$\dfrac{d}{dx} \tan x = \sec^2 x$

$\dfrac{d}{dx} \sin(ax+b) = a\cos(ax+b)$

$\dfrac{d}{dx} \cos(ax+b) = -a\sin(ax+b)$

$\dfrac{d}{dx} \tan(ax+b) = a\sec^2(ax+b)$

$\dfrac{d}{dx} \sec(ax+b) = a\sec(ax+b)\tan(ax+b)$

Partial fractions
num^ = denom^
quotient + rem / divisor

Area of segment $= \frac{1}{2}r^2(\theta - \sin\theta)$

Integration

$\int e^x\,dx = e^x + c$

$\int \frac{1}{x}\,dx = \ln x + c$

$\int \frac{1}{x^2+1}\,dx = \tan^{-1}(x) + c$

$\int \frac{1}{x^2+a^2}\,dx = \frac{1}{a}\tan^{-1}\left[\frac{x}{a}\right] + c$

$\int e^{ax+b}\,dx = \dfrac{e^{ax+b}}{a} + c$

$\int \frac{1}{(Ax+B)^2+a^2} = \frac{1}{a}\tan^{-1}\left(\frac{Ax+B}{a}\right) \times \frac{1}{A}$

$\int \sin x\,dx = -\cos x + c$

$\int \sin(ax+b)\,dx = -\dfrac{\cos(ax+b)}{a} + c$

$\int \cos x\,dx = \sin x + c$

$\int \cos(ax+b)\,dx = \dfrac{\sin(ax+b)}{a} + c$

$\int \sec^2 x\,dx = \tan(x) + c$

$\int \sec^2(ax+b) = \dfrac{\tan(ax+b)}{a} + c$

$\int \dfrac{f'(x)}{f(x)} = \ln(f(x)) + c$

⇒ Multiplication

$u\int v - \int\left(\int v\,dx \cdot \dfrac{du}{dx}\right)$