Calculus Formulae sheet

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\csc\theta = \frac{1}{\sin\theta}$$

$$\sec\theta = \frac{1}{\cos\theta}$$

$$\cot\theta = \frac{1}{\tan\theta}$$

$$\cos^2 + \sin^2 = 1$$

$$\cot^2 + 1 = \csc^2$$

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

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

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

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

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

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

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

$$\sin 2A = 2\sin A\cos A$$

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

$$\cos 2A = 2\cos^2 A - 1$$

$$\cos 2A = 1 - 2\sin^2 A$$

$$\tan 2A = \frac{2\tan A}{1 - \tan^2 A}$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$m = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$$

$$m = \lim_{h \to 0} \frac{f(a+h) - f(a)}{h}$$

$$m = \lim_{x_2 \to x_1} \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

$$S = \frac{a}{1-r}$$

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

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

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

$$\sin(\pi - a) = \sin a$$
$$\cos(\pi - a) = -\cos a$$
$$\tan(\pi - a) = -\tan a$$

$$\sin(\pi + a) = -\sin a$$
$$\cos(\pi + a) = -\cos a$$
$$\tan(\pi + a) = \tan a$$

$$\sin(2\pi - a) = -\sin a$$
$$\cos(2\pi - a) = \cos a$$
$$\tan(2\pi - a) = -\tan a$$

$$\sin(-a) = -\sin a$$
$$\cos(-a) = \cos a$$
$$\tan(-a) = -\tan a$$

$$\sin\left(\frac{\pi}{2} - a\right) = \cos a$$
$$\cos\left(\frac{\pi}{2} - a\right) = \sin a$$

$$\frac{d}{dx}\csc x = -\csc x \cot x$$

$$\frac{d}{dx}\sec x = \sec x \tan x$$

$$\frac{d}{dx}\cot x = -\csc^2 x$$

$$\tan\left(\frac{\pi}{2} - a\right) = \cot a$$

$$\sin\left(\frac{\pi}{2} + a\right) = \cos a$$
$$\cos\left(\frac{\pi}{2} + a\right) = -\sin a$$
$$\tan\left(\frac{\pi}{2} + a\right) = -\cot a$$

$$\sin\left(\frac{3\pi}{2} - a\right) = -\cos a$$
$$\cos\left(\frac{3\pi}{2} - a\right) = -\sin a$$
$$\tan\left(\frac{3\pi}{2} - a\right) = \cot a$$

$$\sin\left(\frac{3\pi}{2} + a\right) = -\cos a$$
$$\cos\left(\frac{3\pi}{2} + a\right) = \sin a$$
$$\tan\left(\frac{3\pi}{2} + a\right) = -\cot a$$