EXAM FORMULA SHEET

ALGEBRA

$$(x \pm y)^3 = x^3 \pm 3x^2y + 3xy^2 \pm y^3 \qquad x^3 \pm y^3 = (x \pm y)(x^2 \mp xy + y^2)$$

$$\text{If } ax^2 + bx + c = 0, \text{ then } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

GEOMETRY

Rectangle	Triangle	Circle
$A = bh$	$A = \frac{1}{2}bh$	$A = \pi r^2$
$P = 2b + 2h$		$C = 2\pi r$
Sphere	**Cylinder**	**Cone**
$V = \frac{4}{3}\pi r^3$	$V = \pi r^2 h$	$V = \frac{1}{3}\pi r h$
$A = 4\pi r$		

TRIGONOMETRY

$$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y \qquad \cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$$

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y} \qquad \sin(2x) = 2 \sin x \cos x$$

$$\cos(2x) = \cos^2 x - \sin^2 x \qquad \tan(2x) = \frac{2 \tan x}{1 - \tan^2 x}$$

$$\sin^2 x = \frac{1 - \cos(2x)}{2} \qquad \cos^2 x = \frac{1 + \cos(2x)}{2}$$

$$\sin^2 x + \cos^2 x = 1 \qquad \tan^2 x + 1 = \sec^2 x$$

SUMATIONS

$\sum_{i=m}^{n} a_i = a_m + a_{m+1} + \cdots + a_{n-1} + a_n$	$\sum_{i=1}^{n} 1 = n$
$\sum_{i=1}^{n} c = nc$	$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$
$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$	$\sum_{i=1}^{n} i^3 = \left[\frac{n(n+1)}{2}\right]^2$

CALCULUS

$\frac{d}{dx}(\arctan x) = \frac{1}{x^2+1}$	$\frac{d}{dx}(\arcsin x) = \frac{1}{\sqrt{1-x^2}}$
$\int \sec x\,dx = \ln\lvert\sec x \tan x\rvert + C$	$\int \csc x\,dx = \ln\lvert\csc x - \cot x\rvert + C$
$\int \tan x\,dx = \ln\lvert\sec x\rvert + C$	$\int \cot x\,dx = \ln\lvert\sin x\rvert + C$