

CAMBRIDGE IGCSE • 0606

IGCSE Add Maths Formula Sheet

The given list for series, binomial and trig, plus the calculus you must learn.

1 Given in the exam: circles, surface area and volume

Printed on page 2 of every 0606 paper.

Equation of a circle, centre (a, b), radius r	$(x - a)^2 + (y - b)^2 = r^2$
Curved surface area of a cone (slant height l)	$A = \pi rl$
Surface area of a sphere	$A = 4\pi r^2$
Volume of a pyramid or cone (base area A)	$V = \frac{1}{3}Ah$
Volume of a sphere	$V = \frac{4}{3}\pi r^3$

2 Given in the exam: algebra, series and trigonometry

Also on the List of formulas, so know how to use them rather than memorise them.

Quadratic formula, for $ax^2 + bx + c = 0$ ($a \neq 0$)	$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$
Binomial expansion (n a positive integer)	$(a + b)^n = a^n + {}^nC_1 a^{n-1}b + {}^nC_2 a^{n-2}b^2 + \dots + b^n$
Binomial coefficient	${}^nC_r = \frac{n!}{r!(n-r)!}$
Arithmetic series: nth term	$u_n = a + (n - 1)d$
Arithmetic series: sum of n terms	$S_n = \frac{1}{2}n(a + l) = \frac{1}{2}n\{2a + (n - 1)d\}$
Geometric series: nth term	$u_n = ar^{n-1}$
Geometric series: sum of n terms ($r \neq 1$)	$S_n = \frac{a(1 - r^n)}{1 - r}$
Geometric series: sum to infinity ($ r < 1$)	$S_\infty = \frac{a}{1 - r}$
Pythagorean identity	$\sin^2 A + \cos^2 A = 1$
Identity with sec	$\sec^2 A = 1 + \tan^2 A$
Identity with cosec	$\operatorname{cosec}^2 A = 1 + \cot^2 A$
Sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Cosine rule	$a^2 = b^2 + c^2 - 2bc \cos A$
Area of a triangle	$\text{Area} = \frac{1}{2}ab \sin C$

3 Not given: formulas to learn

The syllabus gives no formulas for radians or calculus, so learn these.

Arc length (θ in radians)	$s = r\theta$
Area of a sector (θ in radians)	$A = \frac{1}{2}r^2\theta$
Tangent identity	$\tan \theta = \frac{\sin \theta}{\cos \theta}$
Laws of logarithms: product	$\log x + \log y = \log xy$
Laws of logarithms: quotient	$\log x - \log y = \log \frac{x}{y}$
Laws of logarithms: power	$k \log x = \log x^k$
Derivative of x^n	$\frac{d}{dx}(x^n) = nx^{n-1}$
Derivative of $\sin x$ (x in radians)	$\sin x \rightarrow \cos x$
Derivative of $\cos x$	$\cos x \rightarrow -\sin x$
Derivative of $\tan x$	$\tan x \rightarrow \sec^2 x$

Derivative of e^x	$e^x \rightarrow e^x$
Derivative of $\ln x$	$\ln x \rightarrow \frac{1}{x}$
Chain rule	$\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$
Product rule	$\frac{d}{dx}(uv) = u \frac{dv}{dx} + v \frac{du}{dx}$
Quotient rule	$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$
Integral of x^n ($n \neq -1$)	$\int x^n dx = \frac{x^{n+1}}{n+1} + c$
Integral of $1/x$	$\int \frac{1}{x} dx = \ln x + c$

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