

HIGHER SCHOOL CERTIFICATE EXAMINATIONS 2011
FORMULAE SHEET FOR MATHEMATICS A

MENSURATION

Arc Length	$L = \frac{\theta}{360} 2\pi x$
Area of Sector	$A = \frac{\theta}{360} 2\pi x^2$
Surface Area of Cylinder	$A = 2\pi r^2 + 2\pi rh$
Surface Area of Sphere	$A = 4\pi r^2$
Curved Surface Area of Cone	$A = \pi rL$
Volume of Sphere	$V = \frac{4}{3}\pi r^3$
Interior Angles of Polygon	$S_n = (n - 2) \times 180^\circ$

INTEREST

Compound Interest	$A = P\left(1 + \frac{r}{100}\right)^n$
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TRIGONOMETRY

Sin Rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Cosine Rule	$c^2 = a^2 + b^2 - 2ab \cos C$
Area of Triangle	$A = \frac{1}{2} ab \sin C$
Conversion	$\pi^c = 180^\circ$
Arc Length	$L = r\theta^c$
Area of Sector	$A = \frac{1}{2} r^2 \theta$
Area of Minor Segment	$A = \frac{1}{2} r^2 (\theta^c - \sin \theta^c)$

SERIES

Arithmetic Progression	$T_n = a + (n - 1)d$
	$S_n = \frac{n}{2}(a + T_n)$
	$S_n = \frac{n}{2}(2a + [n - 1]d)$
Geometric progression	$T_n = ar^{n-1}$
	$S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}$, for $r \neq 1$
	$S_\infty = \frac{a}{1 - r}$, for $-1 < r < 1$

ALGEBRA

Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
First Derivative	$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = \lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$

ANALYTIC GEOMETRY

Distance between two points	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Mid-point of Interval	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Gradient of a Line	$\frac{y_2 - y_1}{x_2 - x_1} = m = \tan \theta$ $\frac{y_2 - y_1}{x_2 - x_1} = m = \tan \theta$