MATHS Formulae

Paper 2

GRADE 10

ANALYTICAL GEOMETRY

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	Distance
$M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$	Midpoint
$m = \frac{y_2 - y_1}{x_2 - x_1}$	Gradient
$y = mx + c$	Linear standard form

DATA HANDLING

$\bar{x} = \frac{\sum fx}{n}$	Mean

GRADE 11

Grade 10 formulae and:

ANALYTICAL GEOMETRY

$m = \tan\theta$	Inclination
$y - y_1 = m(x - x_1)$	Linear equation

TRIGONOMETRY - 2D AND 3D

$In\ \Delta ABC:\ \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	Sine rule
$a^2 = b^2 + c^2 - 2bc.\cos A$	Cosine rule
$area\ \Delta ABC = \frac{1}{2}ab.\sin C$	Area rule

DATA HANDLING

$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n}$	Variance

GRADE 12

Grade 10 and 11 formulae and:

ANALYTICAL GEOMETRY

$(x - a)^2 + (y - b)^2 = r^2$	Equation of a circle

TRIGONOMETRY

$\sin(\alpha + \beta) = \sin\alpha.\cos\beta + \cos\alpha.\sin\beta$ $\sin(\alpha - \beta) = \sin\alpha.\cos\beta - \cos\alpha.\sin\beta$ $\cos(\alpha + \beta) = \cos\alpha.\cos\beta - \sin\alpha.\sin\beta$ $\cos(\alpha - \beta) = \cos\alpha.\cos\beta + \sin\alpha.\sin\beta$	Compound angles
$\cos 2\alpha = \begin{cases} \cos^2\alpha - \sin^2\alpha \\ 1 - 2\sin^2\alpha \\ 2\cos^2\alpha - 1 \end{cases}$	Double angles cosine
$\sin 2\alpha = 2\sin\alpha.\cos\alpha$	sine