

**Paper Reference 4PM1/01
Pearson Edexcel
International GCSE**

**Further Pure
Mathematics
PAPER 1
(Calculator)**

Formulae Pages

Y66024A

MENSURATION

Surface area of sphere = $4\pi r^2$

Curved surface area of cone =

$\pi r \times$ slant height

Volume of sphere = $\frac{4}{3}\pi r^3$

SERIES

Arithmetic series

$$\text{Sum to } n \text{ terms, } S_n = \frac{n}{2} [2a + (n - 1)d]$$

Geometric series

$$\text{Sum to } n \text{ terms, } S_n = \frac{a(1 - r^n)}{(1 - r)}$$

$$\text{Sum to infinity, } S_\infty = \frac{a}{1 - r} \quad |r| < 1$$

Binomial series

$$(1 + x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \dots + \frac{n(n-1)\dots(n-r+1)}{r!}x^r + \dots$$

for $|x| < 1, n \in \mathbb{Q}$

CALCULUS

Quotient rule (differentiation)

$$\frac{d}{dx} \left(\frac{f(x)}{g(x)} \right) = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$$

TRIGONOMETRY

Cosine rule

In triangle ABC:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

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

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

$$\sin A \cos B + \cos A \sin B$$

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

$$\sin A \cos B - \cos A \sin B$$

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

$$\cos A \cos B - \sin A \sin B$$

(continued on the next page)

Trigonometry continued.

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

$$\cos A \cos B + \sin A \sin B$$

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

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

LOGARITHMS

$$\log_a x = \frac{\log_b x}{\log_b a}$$