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# Level 3 Certificate

# MATHEMATICAL STUDIES

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## Formulae Sheet

### **Information**

This formulae sheet should be issued to all candidates for use with all Mathematical Studies examinations.

These formulae are not required to be learnt. A clean copy of this formulae sheet will be issued to you in the examination.

### Volume and surface area

Shape	Volume	Surface area
Cone	$V = \frac{1}{3}\pi r^2 h$	$A = \pi r l + \pi r^2$
Sphere	$V = \frac{4}{3}\pi r^3$	$A = 4\pi r^2$
Pyramid	$V = \frac{1}{3}\text{base} \times h$	

### Financial calculation – AER

The annual equivalent interest rate (AER),  $r$ , is given by

$$r = \left(1 + \frac{i}{n}\right)^n - 1$$

where  $i$  is the nominal interest rate, and  $n$  the number of compounding periods per year.

Note: the values of  $i$  and  $r$  should be expressed as decimals.

### Financial calculation – APR

The annual percentage interest rate (APR) is given by

$$C = \sum_{k=1}^m \left( \frac{A_k}{(1+i)^k} \right)$$

where  $\pounds C$  is the amount of the loan,  $m$  is the number of repayments,  $i$  is the APR expressed as a decimal,  $\pounds A_k$  is the amount of the  $k$ th repayment,  $t_k$  is the interval in years between the start of the loan and the  $k$ th repayment.

It may be assumed that there are no arrangement or exit fees.

## END OF FORMULAE SHEET

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