



MATHEMATICS:

UNITS 2C AND 2D

FORMULA SHEET

2012

Copyright
© School Curriculum and Standards Authority, 2012

This document—apart from any third party copyright material contained in it—may be freely copied, or communicated on an intranet, for non-commercial purposes by educational institutions, provided that it is not changed in any way and that the School Curriculum and Standards Authority is acknowledged as the copyright owner.

Copying or communication for any other purpose can be done only within the terms of the Copyright Act or by permission of the Authority.

Copying or communication of any third party copyright material contained in this document can be done only within the terms of the Copyright Act or by permission of the copyright owners.

This document is valid for teaching and examining until 31 December 2012.

Numbers and algebra

Index laws: For any numerical value $a \neq 0$, and integers m and n ,

$$a^m a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

Simple interest: $I = Prt$, where P is the principal, r is the rate per year and t is the time in years

Space and measurement

Gradient of line, m , through the points (x_1, y_1) and (x_2, y_2) is given by $m = \frac{y_2 - y_1}{x_2 - x_1}$

Distance d , between the points (x_1, y_1) and (x_2, y_2) is given by $d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$

Lines are perpendicular if $m_1 m_2 = -1$

In a right triangle: $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$

Pythagoras' Theorem: In a right triangle ABC , where a, b are the short sides and c is the hypotenuse
 $c^2 = a^2 + b^2$

In any triangle ABC :

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

$$A = \frac{1}{2} ab \sin C, \text{ where } A \text{ is the area}$$

Space and measurement

Circle: $C = 2\pi r = \pi D$, where C is the circumference, r is the radius and D is the diameter
 $A = \pi r^2$, where A is the area

Triangle: $A = \frac{1}{2}bh$, where b is the base and h is the perpendicular height

Parallelogram: $A = bh$

Trapezium: $A = \frac{1}{2}(a + b)h$, where a and b are the lengths of the parallel sides and h is the perpendicular height

Prism: $V = Ah$, where V is the volume, A is the area of the base and h is the perpendicular height

Pyramid: $V = \frac{1}{3} Ah$

Cylinder: $S = 2\pi rh + 2\pi r^2$, where S is the total surface area
 $V = \pi r^2 h$

Cone: $S = \pi rs + \pi r^2$, where s is the slant height
 $V = \frac{1}{3} \pi r^2 h$

Sphere: $S = 4\pi r^2$
 $V = \frac{4}{3} \pi r^3$

Chance and data

Probability: For any event A and its complement \bar{A}
 $P(A) + P(\bar{A}) = 1$

Note: Any additional formulas identified by the examination panel as necessary will be included in the body of the particular question.

