Government of **Western Australia**
**School Curriculum and Standards Authority**

WACE
Western Australian Certificate of Education

# MATHEMATICS:

# UNITS 2C AND 2D

# FORMULA SHEET
# 2012



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

Mathematics 2C and 2D Formula Sheet updated July 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, $m$, throught the points $(x_1, y_1)$ and $(x_2, y_2)$ is given by $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

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: $\sin\theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$ $\cos\theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$ $\tan\theta = \dfrac{\text{opposite}}{\text{adjacent}}$

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 $ABC$:

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

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

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

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

See next page



## 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 $\overline{A}$
$P(A) + P(\overline{A}) = 1$

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