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.

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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: $\mathrm{I} = Prt$, 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:

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

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

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

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

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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.