

Write your name here

Surname	Other names
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**Edexcel Certificate**  
**Edexcel**  
**International GCSE**

Centre Number

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Candidate Number

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# Mathematics A

## Paper 3H



**Higher Tier**

Friday 11 May 2012 – Afternoon  
**Time: 2 hours**

Paper Reference  
**4MA0/3H**  
**KMA0/3H**

**You must have:**

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.  
Anything you write on the formulae page will gain **NO** credit.

### Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

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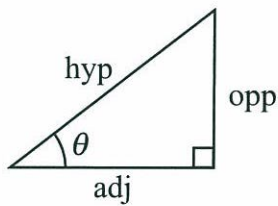
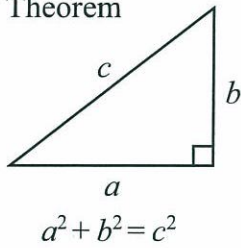
6/6/6/4/4/3



**PEARSON**

## FORMULAE SHEET – HIGHER TIER

Pythagoras' Theorem

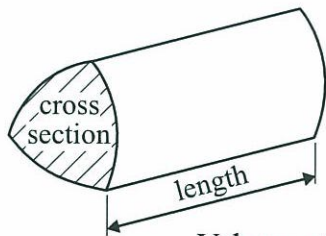


$$\begin{aligned} \text{adj} &= \text{hyp} \times \cos \theta \\ \text{opp} &= \text{hyp} \times \sin \theta \\ \text{opp} &= \text{adj} \times \tan \theta \end{aligned}$$

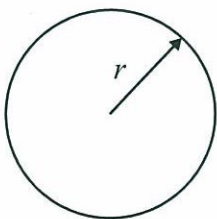
or  $\sin \theta = \frac{\text{opp}}{\text{hyp}}$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

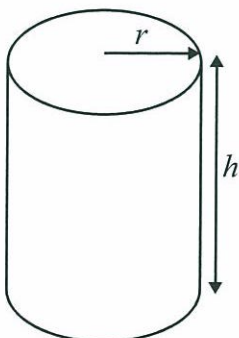


Volume of prism = area of cross section  $\times$  length



Circumference of circle =  $2\pi r$

Area of circle =  $\pi r^2$

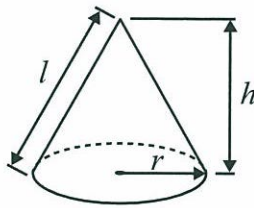


Volume of cylinder =  $\pi r^2 h$

Curved surface area of cylinder =  $2\pi r h$

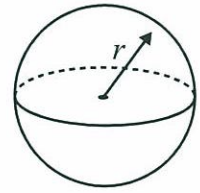
Volume of cone =  $\frac{1}{3} \pi r^2 h$

Curved surface area of cone =  $\pi r l$

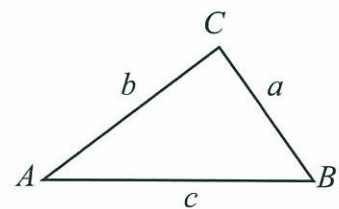


Volume of sphere =  $\frac{4}{3} \pi r^3$

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



In any triangle  $ABC$

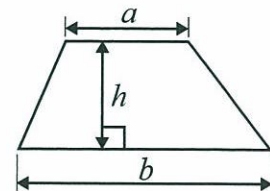


Sine rule:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

Area of triangle =  $\frac{1}{2} ab \sin C$

Area of a trapezium =  $\frac{1}{2}(a + b)h$



The Quadratic Equation

The solutions of  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



Answer ALL TWENTY ONE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 (a) The length of an Airbus A300 aeroplane is 54 m.  
The ratio of the length of this aeroplane to its wingspan is 6 : 5

Work out the wingspan of the aeroplane.

$$54 : x = 6 : 5$$

$$\Rightarrow \frac{x}{54} = \frac{5}{6}$$

$$\Rightarrow x = \frac{5}{6} \times 54 = 45 \text{ m}$$

45 m  
(2)

- (b) A model is made of the Airbus A300 aeroplane.  
The length of the model is 36 cm.  
The length of the real aeroplane is 54 m.

Find the ratio of the length of the model to the length of the real aeroplane.  
Give your ratio in the form 1 : n

$$54 \text{ m} = 5400 \text{ cm}$$

$$\frac{5400}{36} = 150$$

$$\therefore 36 : 5400 = 1 : 150$$

1 : 150  
(3)

(Total for Question 1 is 5 marks)

Do NOT write in this space.



2

$$A = 2x^2 + kx$$

(a)  $x = -3$   
 $k = 4$

Work out the value of  $A$ .

$$\begin{aligned} A &= 2(-3)^2 + 4(-3) \\ &= 2(9) - 12 = 6 \end{aligned}$$

$$A = \underline{6} \quad (2)$$

(b)  $A = 38$   
 $x = 4$

Work out the value of  $k$ .

$$\begin{aligned} k &= \frac{A - 2x^2}{x} = \frac{38 - 2(4^2)}{4} = \frac{38 - 32}{4} = \frac{6}{4} = \frac{3}{2} \\ &= 1.5 \end{aligned}$$

$$k = \underline{1.5} \quad (3)$$

(Total for Question 2 is 5 marks)

Do NOT write in this space.

