Write your name here

Surname		Other names

Centre Number

Candidate Number

Mathematics A
Paper 4H

Higher Tier

Wednesday 16 May 2012 – Morning
Time: 2 hours

Total Marks

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

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.
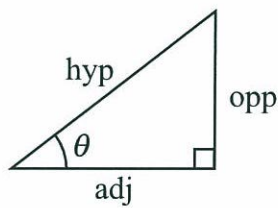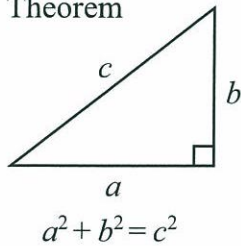
Turn over ▶

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PEARSON

FORMULAE SHEET – HIGHER TIER

Pythagoras' Theorem

$$a^2 + b^2 = c^2$$

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

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

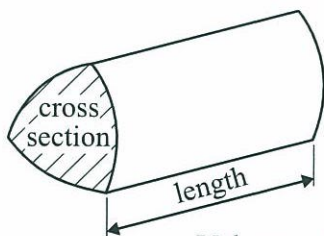**Volume of sphere** $= \frac{4}{3}\pi r^3$

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

$$\text{adj} = \text{hyp} \times \cos\theta$$
$$\text{opp} = \text{hyp} \times \sin\theta$$
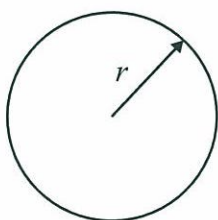$$\text{opp} = \text{adj} \times \tan\theta$$

or

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

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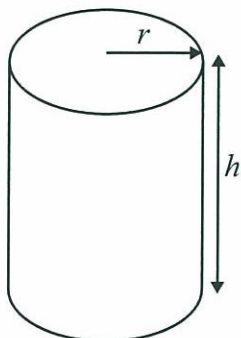
$$\tan\theta = \frac{\text{opp}}{\text{adj}}$$

In any triangle ABC

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

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

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

Volume of prism = area of cross section × length

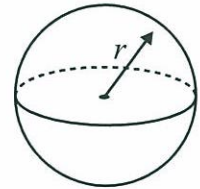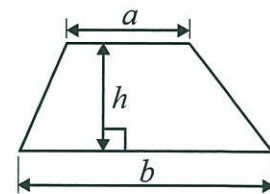**Circumference of circle** $= 2\pi r$

Area of circle $= \pi r^2$

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

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

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

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 TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Work out the value of $\dfrac{6.6 \times 1.2}{4.4 - 2.75}$

.......4·8.......

(Total for Question 1 is 2 marks)

2 A group of students take a test.
The group consists of 12 boys and 8 girls.
The mean mark for the boys is 18
The mean mark for the girls is 16.5

Calculate the mean mark for the whole group.

Mean for whole group $= \dfrac{\text{Sum of boys' scores} + \text{Sum of girls' scores}}{12 + 8}$

$= \dfrac{12(18) + 8(16\cdot5)}{20}$

$= \dfrac{348}{20} = 17\cdot4$

.......17·4.......

(Total for Question 2 is 4 marks)