Paper Reference(s)

5538/19

Edexcel GCSE

Mathematics B – 1388

Paper 19 (Calculator)

Higher Tier

Monday 12 June 2006 – Morning

Time: 1 hour 15 minutes

Materials required for examination	**Items included with question papers**
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 17 questions in this question paper. The total mark for this paper is 62.
There are 16 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

Printer's Log. No.

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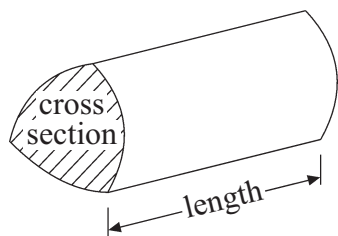W850/R5538/57570   6/6/6/6/6/4/

Turn over

edexcel

GCSE Mathematics 1387/8
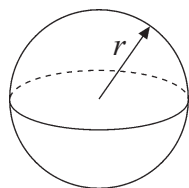
Formulae: Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

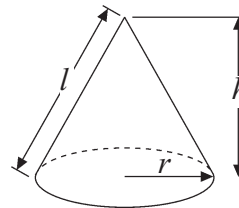**Volume of a prism** = area of cross section × length

Volume of sphere $= \frac{4}{3}\pi r^3$
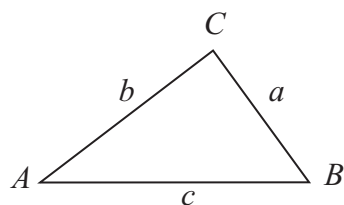
Surface area of sphere $= 4\pi r^2$

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

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

In any triangle ABC

The Quadratic Equation

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

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

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 $= \frac{1}{2}ab \sin C$

Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Amy, Beth and Colin share 36 sweets in the ratio 2 : 3 : 4

   Work out the number of sweets that each of them receives.

   Amy   .... sweets

   Beth   .... sweets

   Colin   .... sweets

   (Total 3 marks)

2. Sophie says 'For any whole number, n, the value of $6n - 1$ is always a prime number'.

   Sophie is wrong.
   Give an example to show that Sophie is wrong.

   (Total 2 marks)

3. (a) Simplify

(i) $x^4 \times x^5$

....

(ii) $\dfrac{p^8}{p^3}$

....

(iii) $3s^2t^3 \times 4s^4t^2$

....

(iv) $(q^3)^4$

....

(5)

(b) Expand $2d(d + 3)$

....

(2)

(Total 7 marks)

4. Work out $\dfrac{\sqrt{2.56} + \sin 57^\circ}{8.765 - 6.78}$

(a) Write down all the figures on your calculator display.

....

(2)

(b) Give your answer to part (a) to an appropriate degree of accuracy.

....

(1)

(Total 3 marks)

Q3

Q4

5. Jim makes a model of his school.

He uses a scale of 1 : 50

The area of the door on his model is 8 cm².

Work out the area of the door on the real school.

.... cm^2

Q5

(Total 2 marks)

6. The table shows some expressions.

p, q and r represent lengths.
π, 2, 3 and 4 are values that have no dimension.

Place a tick (✓) in the appropriate column for each expression to show whether the expression can be used to represent a length, an area, a volume or none of these.

Expression	Length	Area	Volume	None of these
$3pqr$				
$4p + 2q$				
πr^2				

Q6

(Total 3 marks)

7. The first four terms of an arithmetic sequence are

7   13   19   25

Find an expression, in terms of *n*, for the *n*th term of this sequence.

....

(Total 2 marks)

8.
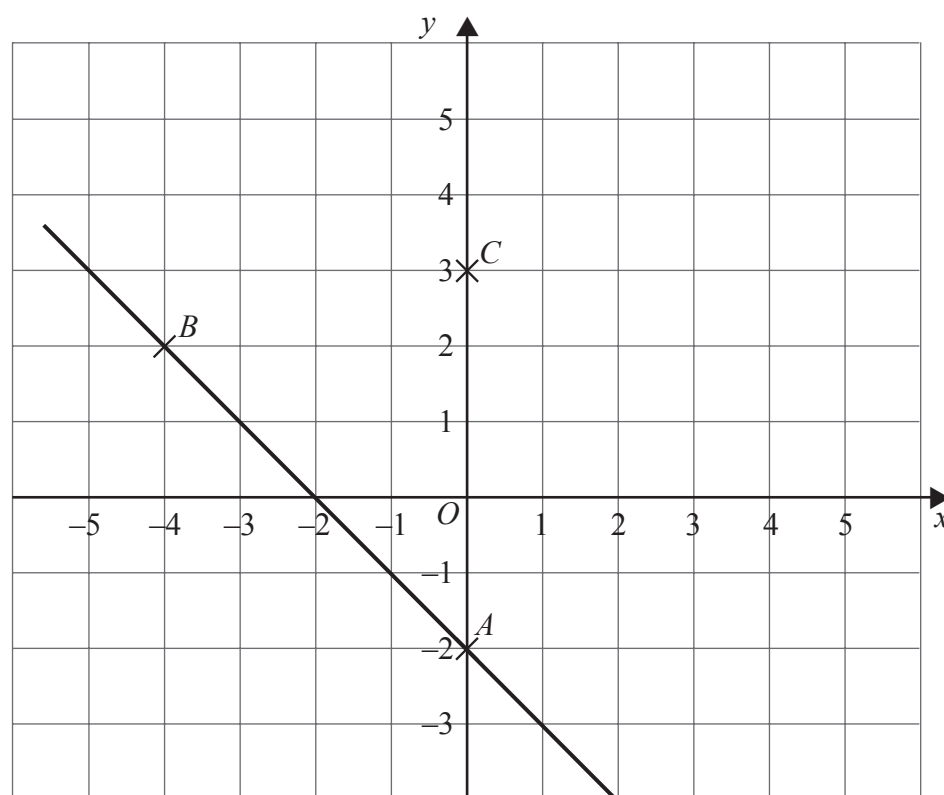
In the diagram   *A* is the point (0, –2),
                  B is the point (–4, 2),
                  C is the point (0, 3).

Find an equation of the line that passes through *C* and is parallel to *AB*.

....

(Total 4 marks)

9. Calculate the length of the side marked x in this right-angled triangle.
Give your answer correct to 3 significant figures.

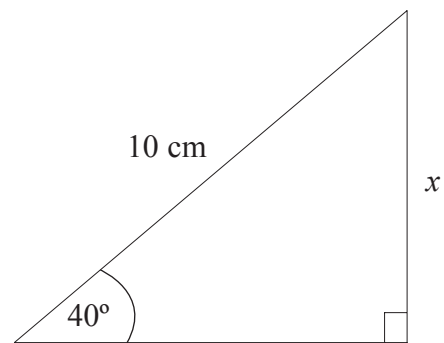Diagram **NOT**
accurately drawn

10 cm

x

40°

.... cm

(Total 3 marks)

10. Expand and simplify $(2x + 5)(3x - 2)$

....

(Total 2 marks)

Turn over

11.

C

73°

10 cm

7 cm

A B
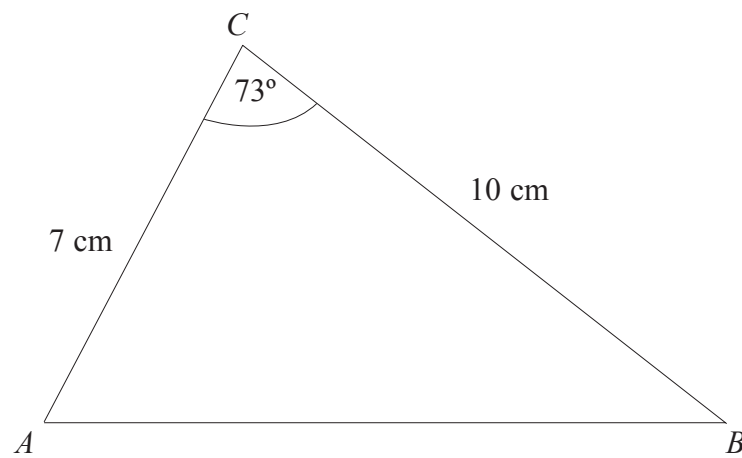
In triangle *ABC*,
AC = 7 cm,
BC = 10 cm,
angle *ACB* = 73°.

Calculate the length of *AB*.
Give your answer correct to 3 significant figures.

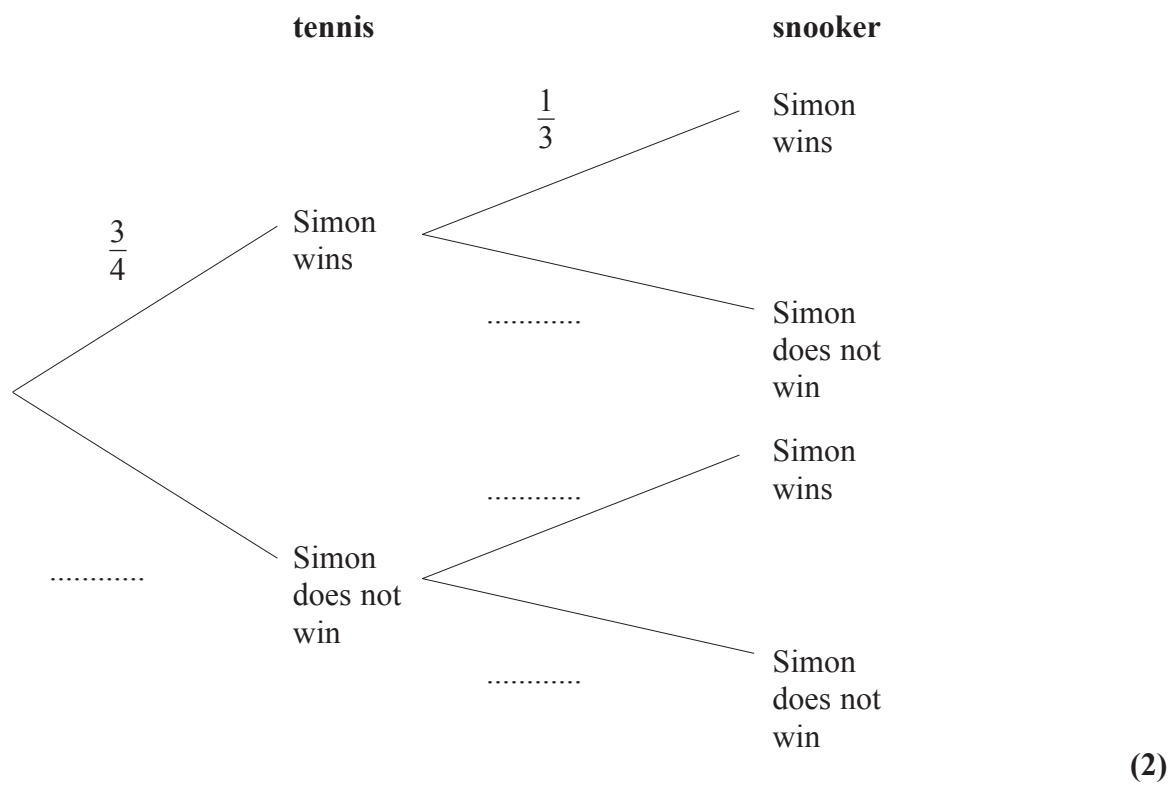.............................. cm

(Total 3 marks)

Q11

12. Simon plays one game of tennis and one game of snooker.

The probability that Simon will win at tennis is $\frac{3}{4}$

The probability that Simon will win at snooker is $\frac{1}{3}$

(a) Complete the probability tree diagram.

(2)

(b) Work out the probability that Simon wins both games.

....
(2)

(c) Work out the probability that Simon will win only one game.

....
(3)

(Total 7 marks)

13. The length of a rectangle is 6.7 cm, correct to 2 significant figures.

(a) For the length of the rectangle write down

(i) the upper bound,

.... cm

(ii) the lower bound.

.... cm

(2)

The area of the rectangle is 26.9 cm², correct to 3 significant figures.

(b) (i) Calculate the upper bound for the width of the rectangle.
Write down all the figures on your calculator display.

.... cm

(ii) Calculate the lower bound for the width of the rectangle.
Write down all the figures on your calculator display.

.... cm

(3)

(c) Write down the width of the rectangle to an appropriate degree of accuracy.

.... cm

(1)

Q13

(Total 6 marks)

14.

B

Diagram **NOT** accurately drawn

A   C

10.4 cm   120º   10.4 cm

O

The diagram shows a sector *OABC* of a circle with centre *O*.
OA = OC = 10.4 cm.
Angle *AOC* = 120°.

Calculate the area of the shaded segment *ABC*.
Give your answer correct to 3 significant figures.

.... cm²

Q14

(Total 4 marks)

15. The table gives information about the number of girls in each of four schools.

School	A	B	C	D	Total
Number of girls	126	82	201	52	461

Jenny did a survey of these girls.
She used a stratified sample of exactly 80 girls according to school.

Work out the number of girls from each school that were in her sample of 80.
Complete the table.

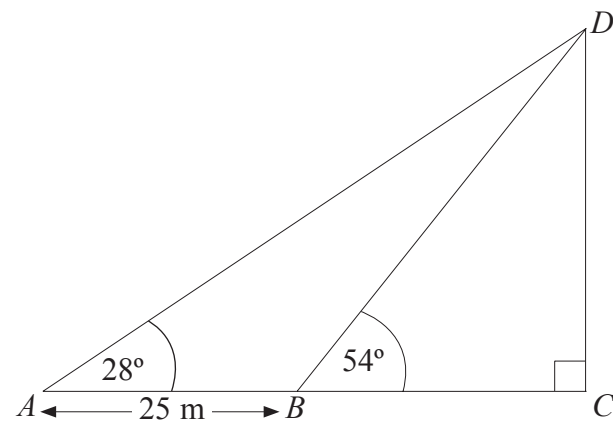| School	A	B	C	D	Total
Number of girls					80

16.

Diagram **NOT** accurately drawn

The diagram shows a vertical tower *DC* on horizontal ground *ABC*. *ABC* is a straight line.

The angle of elevation of *D* from *A* is 28º.
The angle of elevation of *D* from *B* is 54º.

AB = 25 m.

Calculate the height of the tower.
Give your answer correct to 3 significant figures.
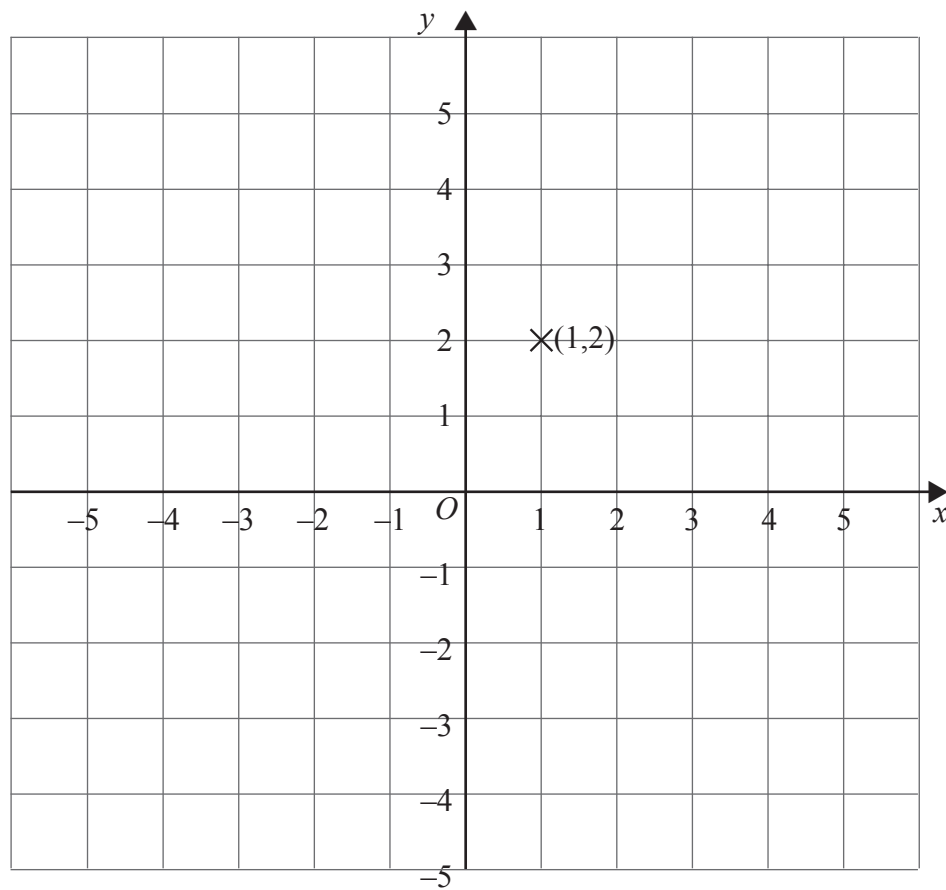
.... m

Q16

(Total 5 marks)

17. Show that any straight line that passes through the point (1, 2) must intersect the curve with equation $x^2 + y^2 = 16$ at two points.

(Total 3 marks)

TOTAL FOR PAPER: 62 MARKS

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