

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						5	5	3	8	/	1	8	Signature	

Paper Reference(s)

**5538/18**

**Edexcel GCSE**

**Mathematics B – 1388**

**Paper 18 (Non-Calculator)**

**Higher Tier**

**Tuesday 7 June 2005 – Afternoon**

**Time: 1 hour 15 minutes**

Examiner's use only

--	--	--

Team Leader's use only

--	--	--



**Materials required for examination**

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

**Items included with question papers**

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**

There are 15 questions in this paper. The total mark for this paper is 62.

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

**Calculators must not be used.**

**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.

This publication may be reproduced only in accordance with Edexcel Limited copyright policy.  
©2005 Edexcel Limited.

Printer's Log. No.

**N21064A**

W850/R1388/57570 6/6/6/6/

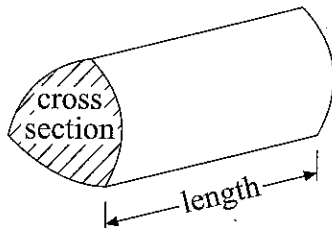


**Turn over**

**edexcel**

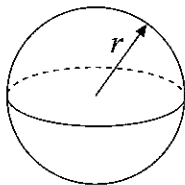
**You must not write on this page.**  
**Anything you write on this page will gain NO credit.**

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



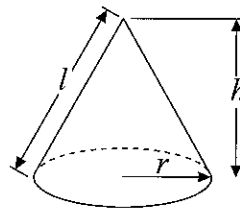
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

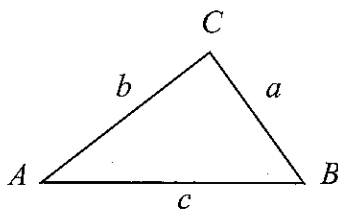


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

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

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

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



**Answer ALL FIFTEEN questions.**

**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

**You must NOT use a calculator.**

1. Factorise  $p^2 + 6p$

.....

**(Total 2 marks)**

**Q1**

2. Janie wants to collect information about the amount of sleep the students in her class get.

Design a suitable question she could use.

**(Total 2 marks)**

**Q2**



3. Work out the value of  $1\frac{2}{3} + 2\frac{3}{4}$ .

Give your answer as a fraction in its simplest form.

.....

(Total 3 marks)

Q3

4. The table shows some expressions.

$a$ ,  $b$ ,  $c$  and  $d$  represent lengths.

$\pi$  and 3 are numbers which have no dimensions.

$3a^2$	$\frac{\pi ab^3}{3d}$	$\pi bc$	$ac + bd$	$\pi(a + b)$	$3(c + d)^3$	$3\pi bc^2$

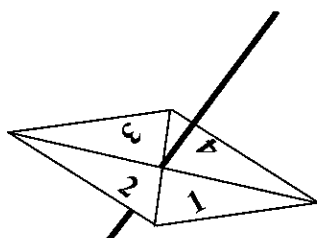
Tick (✓) the boxes underneath the **three** expressions which could represent volumes.

(Total 3 marks)

Q4



5. Here is a 4-sided spinner.



The sides of the spinner are labelled 1, 2, 3 and 4.

The spinner is biased.

The probability that the spinner will land on each of the numbers 2 and 3 is given in the table.

The probability that the spinner will land on 1 is equal to the probability that it will land on 4.

Number	1	2	3	4
Probability	$x$	0.3	0.2	$x$

(a) Work out the value of  $x$ .

$x = \dots\dots\dots$   
(2)

Sarah is going to spin the spinner 200 times.

(b) Work out an estimate for the number of times it will land on 2

$\dots\dots\dots$   
(2)  
(Total 4 marks)

Q5



6.

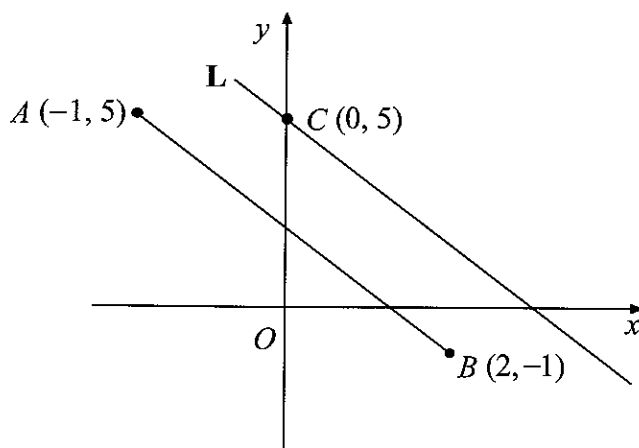


Diagram NOT  
accurately drawn

The diagram shows three points  $A(-1, 5)$ ,  $B(2, -1)$  and  $C(0, 5)$ .  
The line  $L$  is parallel to  $AB$  and passes through  $C$ .

(a) Find the equation of the line  $L$ .

.....  
(4)

The line  $M$  is perpendicular to  $AB$  and passes through  $(0, 0)$ .

(b) Find the equation of the line  $M$ .

.....  
(2)

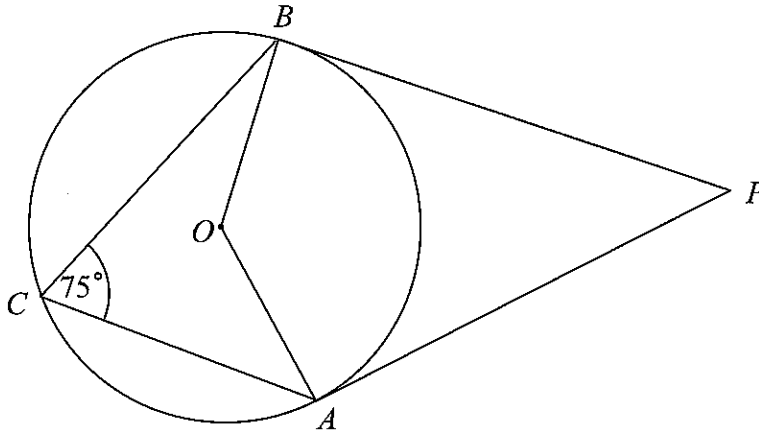
(Total 6 marks)

Q6



7.

Diagram **NOT**  
accurately drawn



In the diagram,  $A$ ,  $B$  and  $C$  are points on the circumference of a circle, centre  $O$ .  
 $PA$  and  $PB$  are tangents to the circle.  
 Angle  $ACB = 75^\circ$ .

(a) (i) Work out the size of angle  $AOB$ .

○

.....

(ii) Give a reason for your answer.

.....

.....

(2)

(b) Work out the size of angle  $APB$ .

○

.....

(3)

(Total 5 marks)

Q7



N 2 1 0 6 4 A 0 7 1 6

8. (a) Change  $\frac{3}{11}$  to a decimal.

.....  
(1)

(b) Prove that the recurring decimal  $0.\dot{3}\dot{9} = \frac{13}{33}$

(3)

(Total 4 marks)

Q8





9.  $d$  is directly proportional to the square of  $t$ .  
 $d = 80$  when  $t = 4$

(a) Express  $d$  in terms of  $t$ .

.....  
 (3)

(b) Work out the value of  $d$  when  $t = 7$

$d =$  .....  
 (1)

(c) Work out the positive value of  $t$  when  $d = 45$

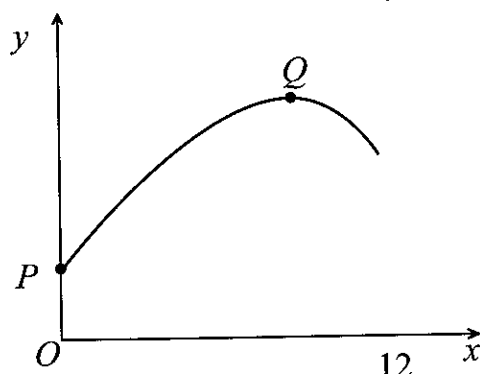
$t =$  .....  
 (2)

(Total 6 marks)

Q9



10. Here is a sketch of the graph of  $y = 25 - \frac{(x-8)^2}{4}$  for  $0 \leq x \leq 12$



$P$  and  $Q$  are points on the graph.  
 $P$  is the point at which the graph meets the  $y$ -axis.  
 $Q$  is the point at which  $y$  has its maximum value.

(a) Find the coordinates of

(i)  $P$ ,

( ..... , ..... )

(ii)  $Q$ .

( ..... , ..... )  
(3)

(b) Show that  $25 - \frac{(x-8)^2}{4} = \frac{(2+x)(18-x)}{4}$

(3)

Q10

(Total 6 marks)



11.

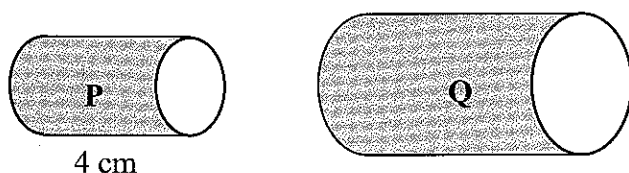


Diagram **NOT**  
accurately drawn

Two cylinders, **P** and **Q**, are mathematically similar.  
The total surface area of cylinder **P** is  $90\pi \text{ cm}^2$ .  
The total surface area of cylinder **Q** is  $810\pi \text{ cm}^2$ .  
The length of cylinder **P** is 4 cm.

- (a) Work out the length of cylinder **Q**.

..... cm  
(3)

The volume of cylinder **P** is  $100\pi \text{ cm}^3$ .

- (b) Work out the volume of cylinder **Q**.  
Give your answer as multiple of  $\pi$ .

.....  $\text{cm}^3$   
(2)

(Total 5 marks)

Q11



12. (a) Find the value of

(i)  $64^0$

(ii)  $64^{\frac{1}{2}}$

(iii)  $64^{-\frac{2}{3}}$

(b)  $3 \times \sqrt{27} = 3^n$

Find the value of  $n$ .

$n = \dots\dots\dots$

(2)

(Total 6 marks)

Q12



13. Diagram 1 is a sketch of part of the graph of  $y = \sin x^\circ$ .

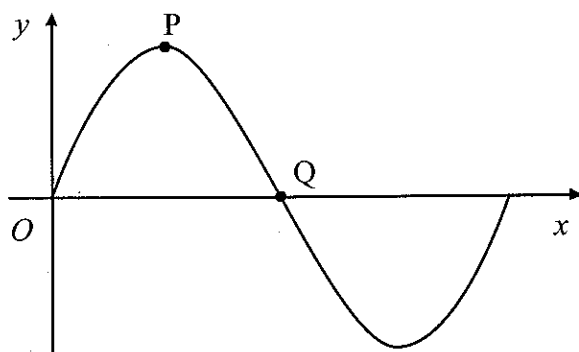


Diagram 1

(a) Write down the coordinates of

(i)  $P$ ,

( ..... , ..... )

(ii)  $Q$ .

( ..... , ..... )  
(2)

Diagram 2 is a sketch of part of the graph of  $y = 3\cos 2x^\circ$ .

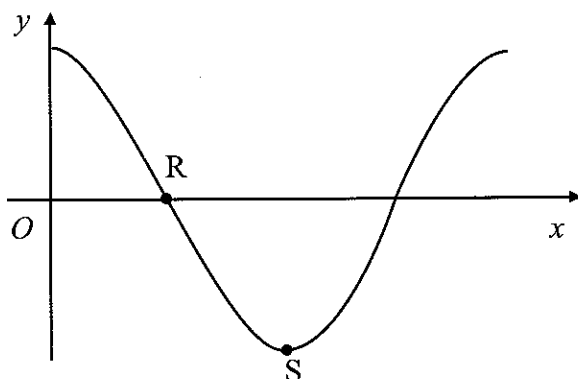


Diagram 2

(b) Write down the coordinates of

(i)  $R$ ,

( ..... , ..... )

(ii)  $S$ .

( ..... , ..... )

(2)

(Total 4 marks)

Q13



14.

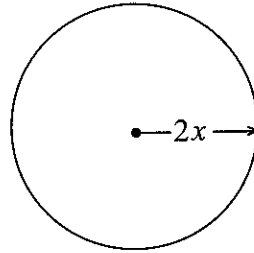
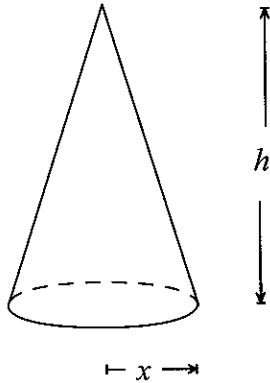


Diagram **NOT**  
accurately drawn

The radius of the base of a cone is  $x$  cm and its height is  $h$  cm.  
The radius of a sphere is  $2x$  cm.  
The volume of the cone and the volume of the sphere are equal.

Express  $h$  in terms of  $x$ .  
Give your answer in its simplest form.

$h = \dots\dots\dots$

(Total 3 marks)

Q14

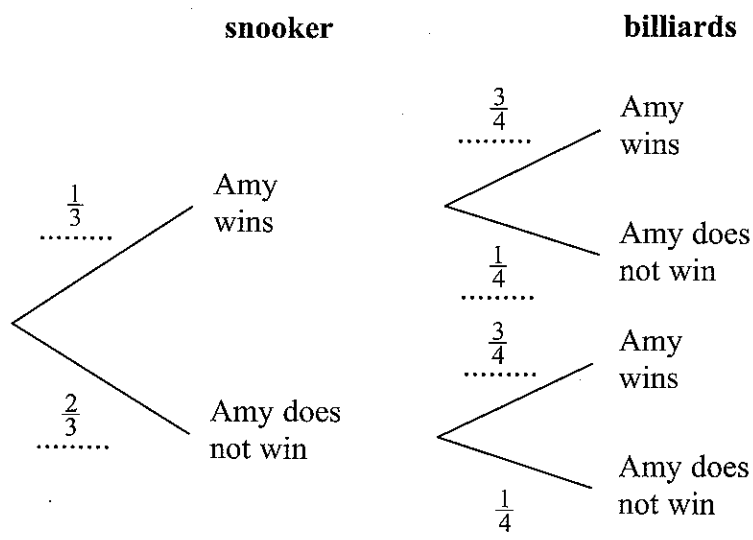


15. Amy is going to play one game of snooker and one game of billiards.

The probability that she will win the game of snooker is  $\frac{1}{3}$

The probability that she will win the game of billiards is  $\frac{3}{4}$

The probability tree diagram shows this information.



Amy played one game of snooker and one game of billiards on a number of Fridays.  
She won at **both** snooker and billiards on 21 Fridays.

Work out an estimate for the number of Fridays on which Amy did not win either game.

.....

Q15

(Total 3 marks)

TOTAL FOR PAPER: 62 MARKS

END



**BLANK PAGE**

