Centre No.						Paper Reference								Surname	Initial(s)
Candidate No.						5	3	8	4	H	/	1	3	H	Signature

Paper Reference(s)

5384H/13H

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics (Modular) – 2381

Paper 13 (Non-Calculator)

Higher Tier

Unit 3

Tuesday 9 November 2010 – Morning

Time: 1 hour 10 minutes

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. Write your answers 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 60.
There are 16 pages in this question paper. Any blank pages are indicated.
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.

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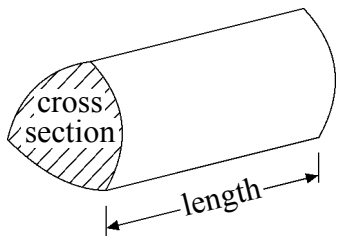
GCSE Mathematics 2381

Formulae: Higher Tier

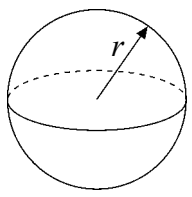
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



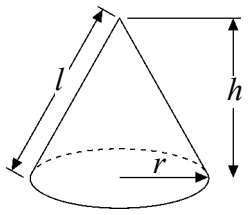
Volume of sphere $= \frac{4}{3}\pi r^3$

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

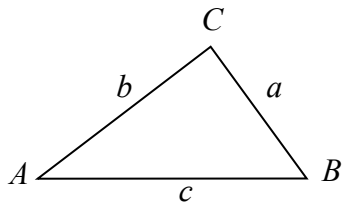


Volume of cone $= \frac{1}{3}\pi r^2 h$

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

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

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

Leave blank

Answer ALL SEVENTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. A box contains milk chocolates and dark chocolates only.
The number of milk chocolates to the number of dark chocolates is in the ratio 2 : 1

There are 24 milk chocolates.

Work out the total number of chocolates.

.....

(Total 2 marks)

Q1

2. Steve makes a scale drawing of his school hall.

He uses a scale of 1 : 200

On the scale drawing the length of the school hall is 15 cm.

What is the real length of the school hall?

.....

(Total 2 marks)

Q2

Leave blank

3. Here is a sketch of a triangle.

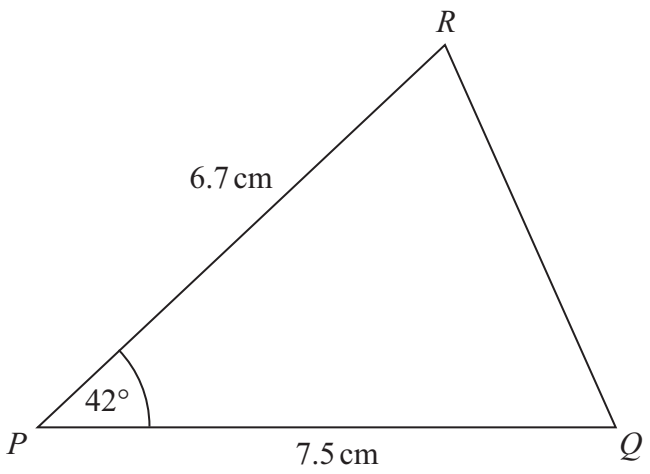


Diagram **NOT** accurately drawn

In the space below, draw an accurate diagram of triangle *PQR*.
The line *PQ* has been drawn for you.

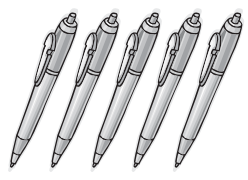
P *Q*

Q3

(Total 2 marks)

4. Yasmin can buy 5 identical pens for 75p.

How much should she pay for 3 of these pens?



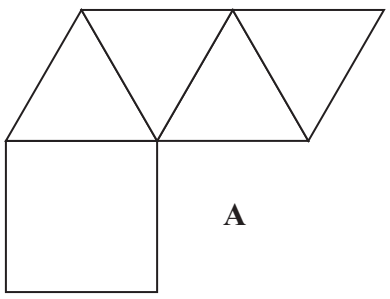
..... p

Q4

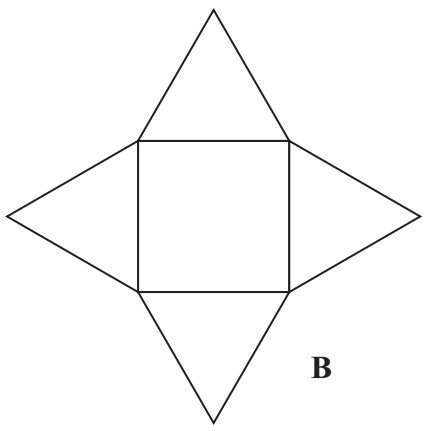
(Total 2 marks)

Leave blank

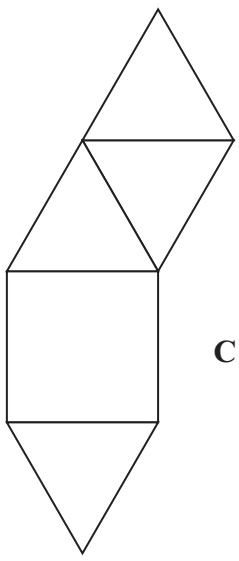
5. Here are 5 diagrams.



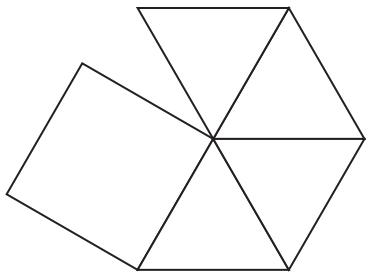
A



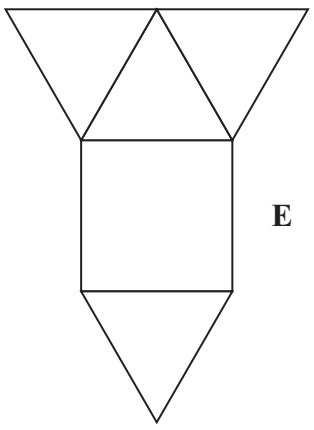
B



C



D



E

Two of these diagrams show a net for a square-based pyramid.

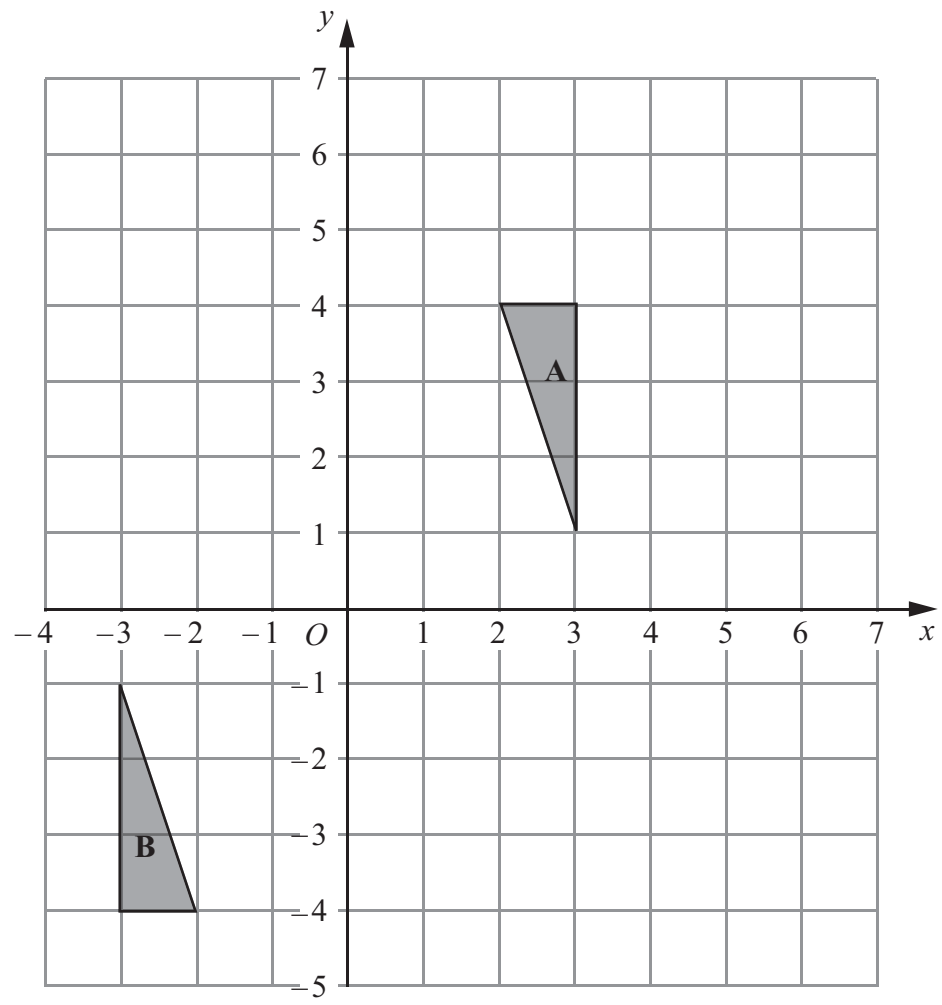
Write down the letter of each of these two diagrams.

..... and **Q5**

(Total 2 marks)

Leave blank

6.



Triangle **A** and triangle **B** are drawn on the grid.

(a) Describe fully the single transformation which maps triangle **A** onto triangle **B**.

.....

.....

(3)

(b) Translate triangle **A** by the vector $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$.

Label the new triangle **C**.

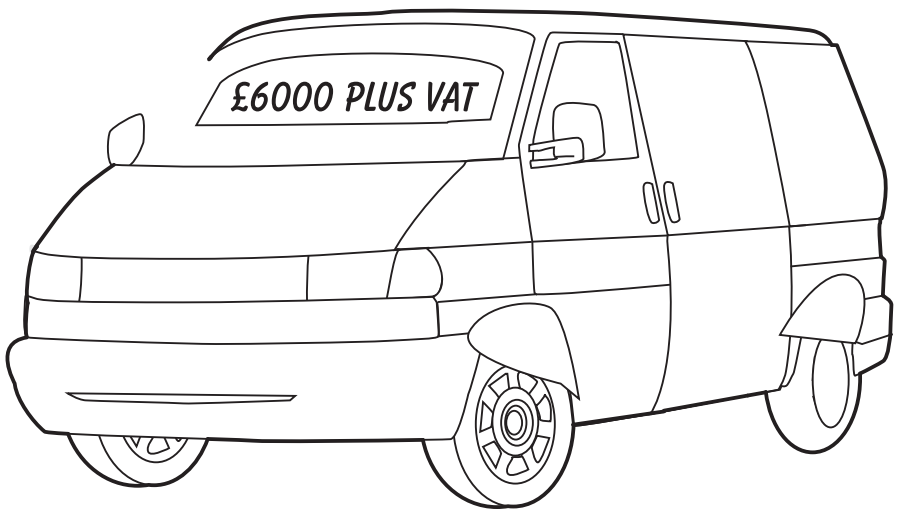
(1)

(Total 4 marks)

Q6

Leave blank

7. Lizzie bought a van.
The total cost of the van was £6000 **plus** VAT at $17\frac{1}{2}$ %.



Lizzie paid £3000 when she got the van.
She paid the rest of the total cost of the van in 10 equal monthly payments.

Work out the amount of each monthly payment.

£ .....

(Total 6 marks)

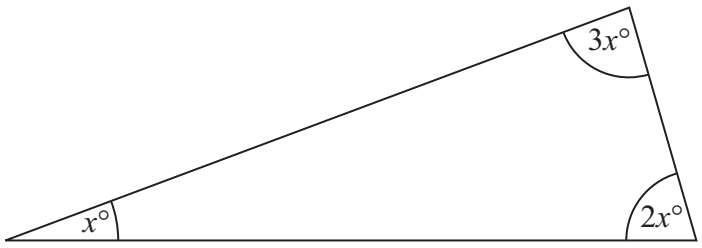
Q7

Turn over

Leave blank

8.

Diagram **NOT** accurately drawn



The three angles of this triangle are $x°$, $2x°$ and $3x°$.

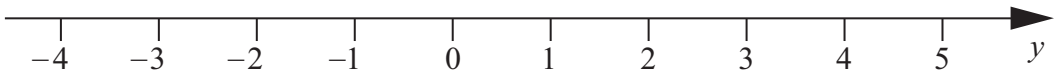
Find the size of the angle marked $x°$.

.....

(Total 2 marks)

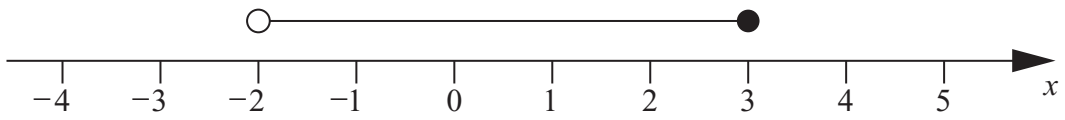
Q8

9. (a) On the number line below mark the inequality $-1 < y < 4$



(1)

(b) Here is an inequality, in x, shown on a number line.



Write down the inequality.

.....

(2)

(c) Solve the inequality $3t + 5 > 17$

.....

(2)

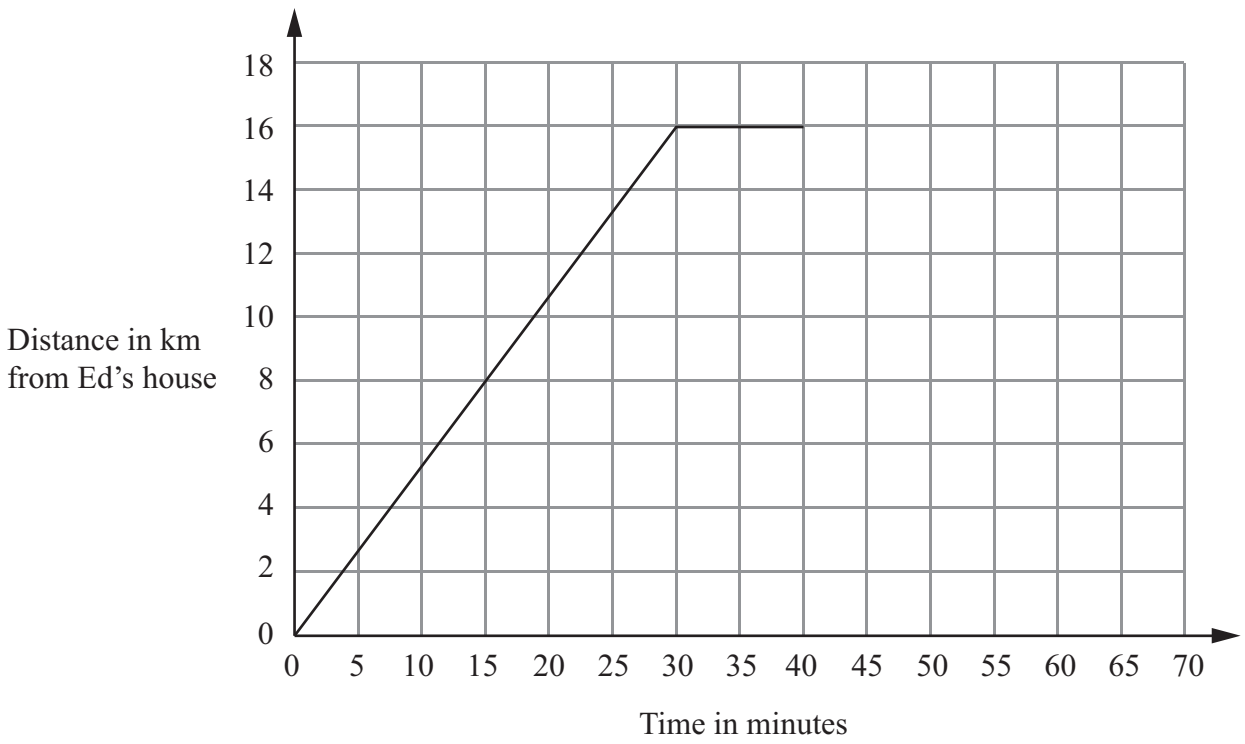
Q9

(Total 5 marks)

Leave blank

10. Ed went from his home to the shops and then home again.

Here is part of a travel graph for Ed's journey.



(a) Work out the average speed for the first 30 minutes of Ed's journey.

Give your answer in km per hour.

..... km per hour
(2)

Ed was at the shops for 10 minutes.
He then went home.

His journey home took 25 minutes.

(b) Complete the travel graph.

(1)

(Total 3 marks)

Q10

Leave blank

11. (a) Work out $2\frac{17}{20} - 1\frac{2}{5}$

.....

(3)

(b) Work out $2\frac{2}{3} \times 1\frac{3}{4}$

.....

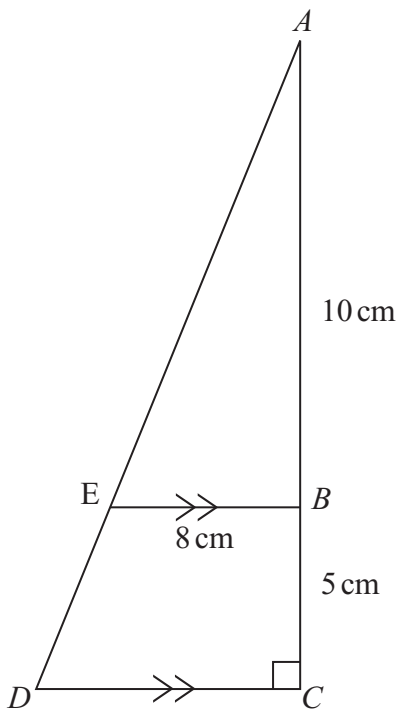
(3)

Q11

(Total 6 marks)

Leave blank

12.



ABC and *AED* are straight lines.
EB is parallel to *DC*.
Angle *ACD* = 90°.

AB = 10 cm.
BC = 5 cm.
EB = 8 cm.

(a) Work out the length of *DC*.

.....cm
(2)

(b) Work out the area of the trapezium *EBCD*.

.....cm^2
(2)

Q12

(Total 4 marks)

Turn over

Leave blank

13. Solve the simultaneous equations

$$6x + 2y = -3$$
$$4x - 3y = 11$$

$x =$ ....., $y =$ .....

Q13

(Total 4 marks)

14. Solve $x^2 + 8x - 9 = 0$

.....

Q14

(Total 3 marks)

Leave blank

15. P is inversely proportional to V.

When $V = 8$, $P = 5$

(a) Find a formula for P in terms of V.

$P =$ .....

(3)

(b) Calculate the value of P when $V = 2$

.....

(1)

Q15

(Total 4 marks)

Leave blank

16.

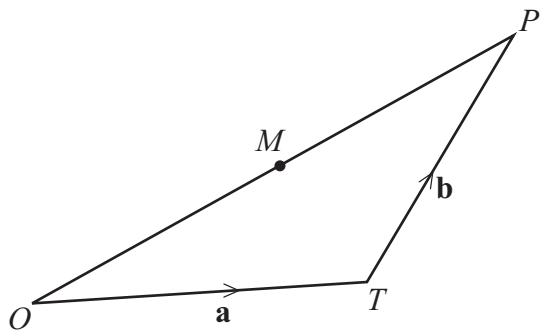


Diagram **NOT** accurately drawn

OPT is a triangle.
M is the midpoint of *OP*.

$\overrightarrow{OT} = \mathbf{a}$

$\overrightarrow{TP} = \mathbf{b}$

(a) Express $\overrightarrow{OM}$ in terms of **a** and **b**.

$\overrightarrow{OM}$ = ...

(2)

(b) Express $\overrightarrow{TM}$ in terms of **a** and **b**.
Give your answer in its simplest form.

$\overrightarrow{TM}$ = ...

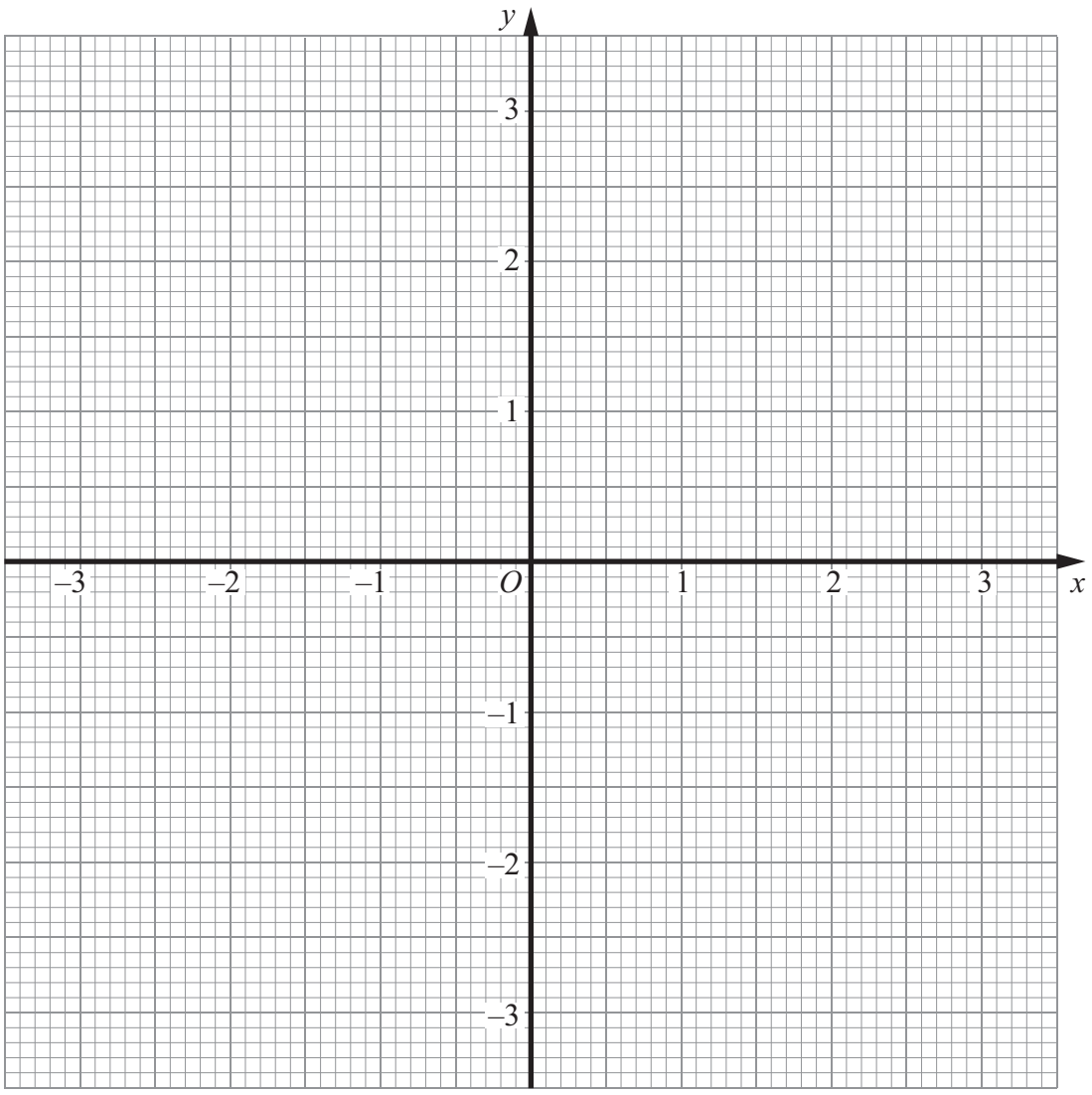
(2)

Q16

(Total 4 marks)

Leave blank

17. (a) Construct the graph of $x^2 + y^2 = 9$



(2)

(b) By drawing the line $x + y = 1$ on the grid, solve the equations

$x^2 + y^2 = 9$
$x + y = 1$

$x =$ ....., $y =$ .....

or $x =$ ....., $y =$ .....

(3)

Q17

(Total 5 marks)

TOTAL FOR PAPER: 60 MARKS

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