Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						1	3	8	0	/	3	H	Signature	

Paper Reference(s)

1380/3H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 3 (Non-Calculator)

Higher Tier

Tuesday 9 November 2010 – Morning

Time: 1 hour 45 minutes

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

Examiner's use only

Team Leader's use only

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 28 questions in this question paper. The total mark for this paper is 100.
There are 28 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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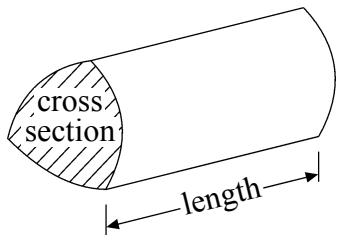
GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

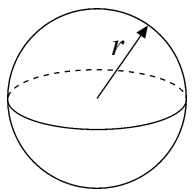
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



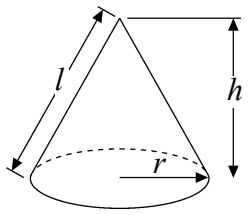
Volume of sphere $= \frac{4}{3}\pi r^3$

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

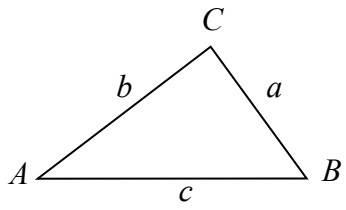


Volume of cone $= \frac{1}{3}\pi r^2 h$

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 TWENTY EIGHT 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. (a) Simplify $p \times p \times p \times p$

.....

(1)

(b) Simplify $2c \times 3d$

.....

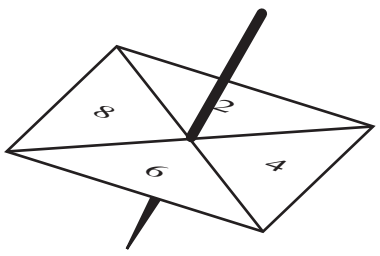
(1)

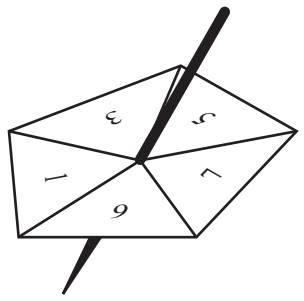
Q2

(Total 2 marks)

Leave blank

3. Louise spins a four-sided spinner and a five-sided spinner.





The four-sided spinner is labelled 2, 4, 6, 8
The five-sided spinner is labelled 1, 3, 5, 7, 9

Louise adds the score on the four-sided spinner to the score on the five-sided spinner.
She records the possible total scores in a table.

4-sided spinner

5-sided spinner	+	2	4	6	8
	1	3	5	7	9
	3	5	7	9	11
	5	7	9	11	13
	7	9	11		
	9	11	13		

(a) Complete the table of possible total scores.

(1)

(b) Write down all the ways in which Louise can get a total score of 11
One way has been done for you.

(2, 9) .....

(2)

Both spinners are fair.

(c) Find the probability that Louise's total score is less than 6

.....

(2)

Q3

(Total 5 marks)

Leave blank

4. Here are the first five terms of an arithmetic sequence.

2 6 10 14 18

(a) Find, in terms of n, an expression for the nth term of this sequence.

.....

(2)

(b) An expression for the nth term of another sequence is $10 - n^2$

(i) Find the third term of this sequence.

.....

(ii) Find the fifth term of this sequence.

.....

(2)

Q4

(Total 4 marks)

Turn over

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5.

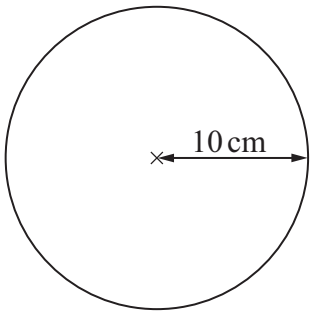


Diagram **NOT** accurately drawn

The radius of a circle is 10 cm.

Work out the area of this circle.
Use $\pi = 3.14$

.....cm^2

Q5

(Total 2 marks)

6. Work out an estimate for $\dfrac{3870}{236 \times 4.85}$

.....

Q6

(Total 2 marks)

Leave blank

7. Paul drives 175 miles to a meeting.
His company pays him 37p for each mile.

Work out how much the company pays Paul.

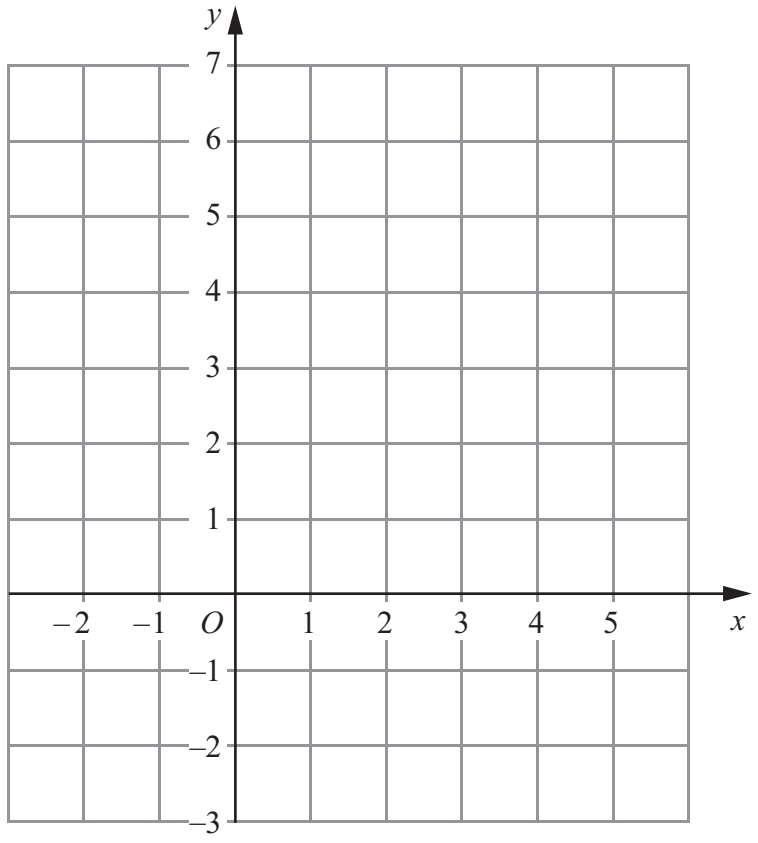
£ .....

(Total 3 marks)

Q7

Leave blank

8. On the grid draw the graph of $x + y = 4$ for values of x from −2 to 5



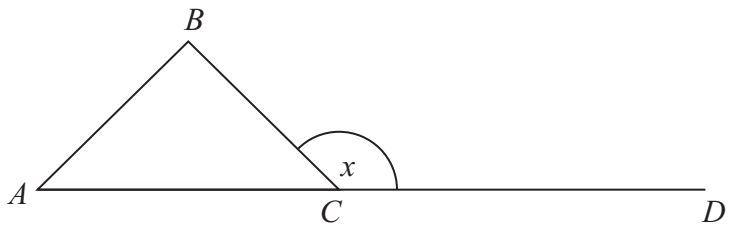
Q8

(Total 3 marks)

Leave blank

9.

Diagram **NOT** accurately drawn



ABC is an equilateral triangle.
ACD is a straight line.

(a) Work out the size of the angle marked *x*.

..... °

(2)

(b) Give a reason for your answer.

.....

.....

(1)

Q9

(Total 3 marks)

Leave blank

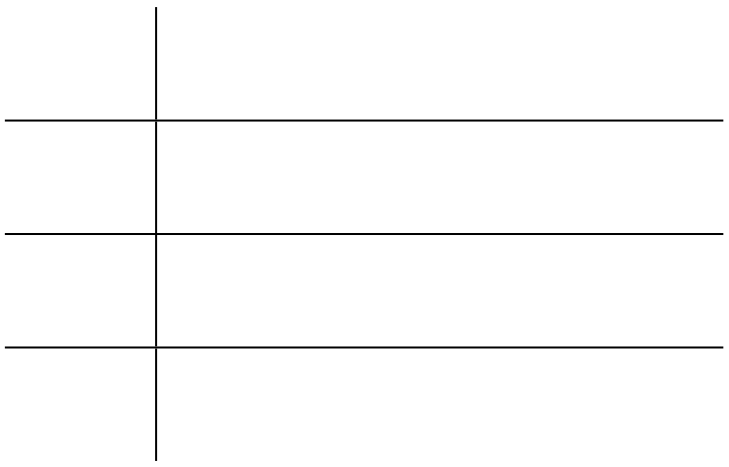
10. Chris plays golf.

Here are 15 of his scores.

69	78	82	86	77
83	91	77	92	80
74	81	83	77	72

(a) Draw an ordered stem and leaf diagram to show this information.

You must include a key.



Key:

(3)

(b) Write down the mode.

.....

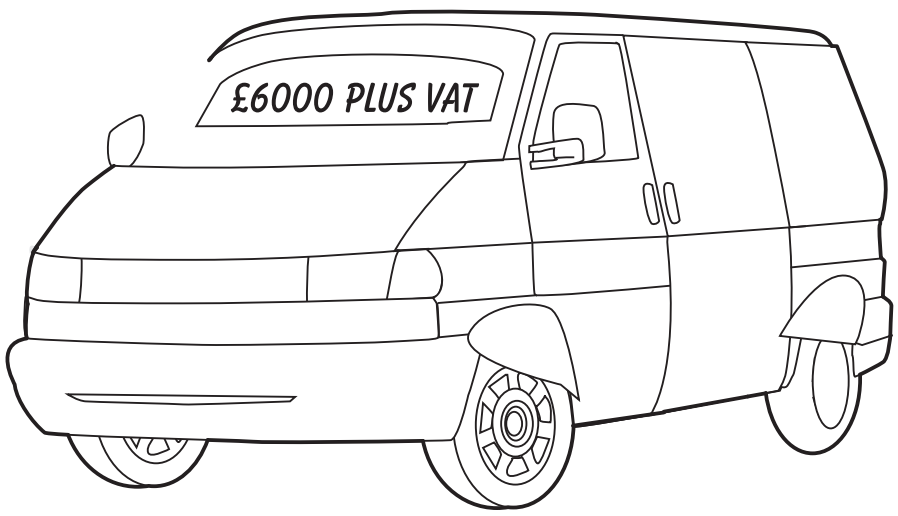
(1)

Q10

(Total 4 marks)

Leave blank

11. 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.

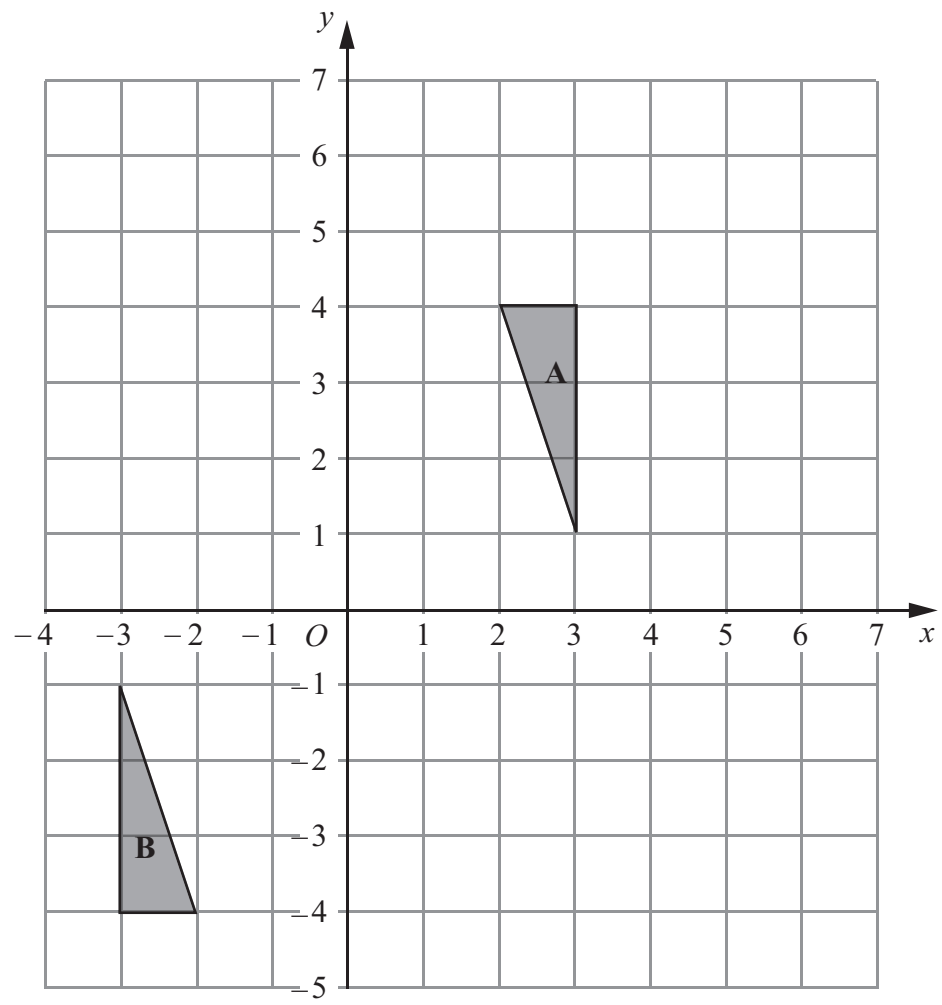
£ .....

(Total 6 marks)

Q11

Leave blank

12.



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)

Q12

13. Make v the subject of the formula $t = \frac{v}{5} + 2$

Leave blank

$v =$ .....

Q13

(Total 2 marks)

14.

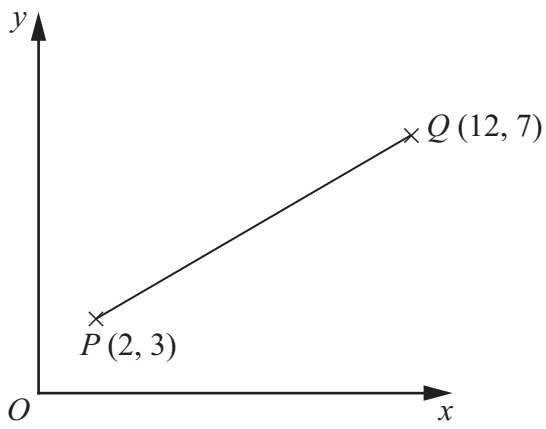


Diagram **NOT** accurately drawn

P is the point with coordinates (2, 3).
Q is the point with coordinates (12, 7).

Work out the coordinates of the midpoint of the line PQ.

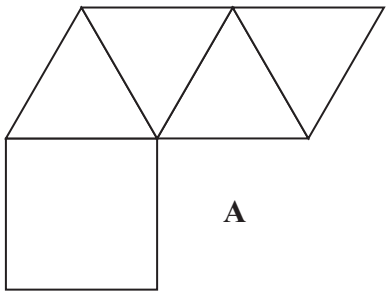
(....., ...)

Q14

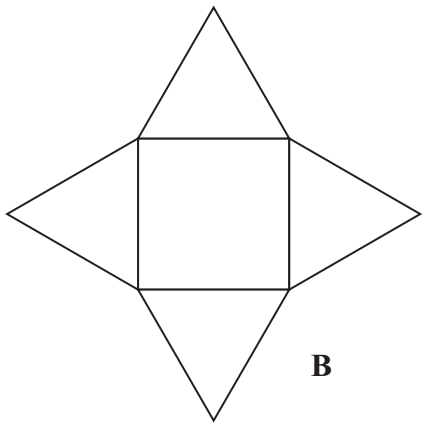
(Total 2 marks)

Leave blank

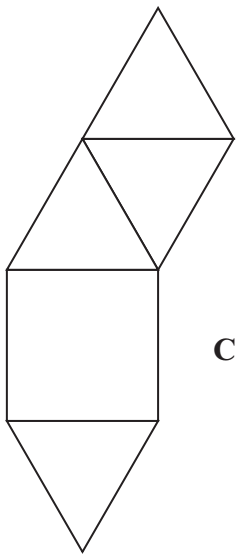
15. Here are 5 diagrams.



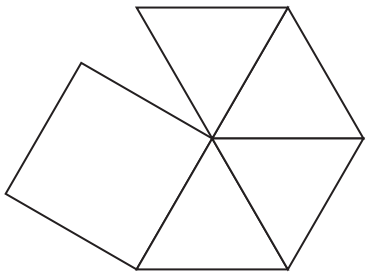
A



B



C



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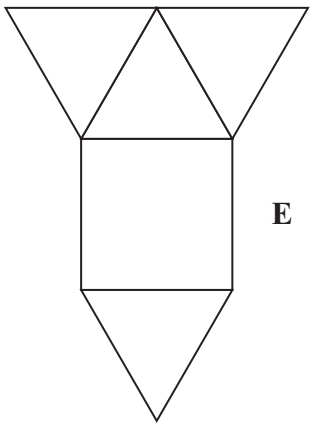


E

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

Write down the letter of each of these two diagrams.

..... and .....

(Total 2 marks)

Q15

Leave blank

16. (a) Expand and simplify $3(x + 5) + 2(5x – 6)$

.....

(2)

(b) Simplify $\frac{2x+4}{2}$

.....

(1)

(c) Factorise $5x + 10$

.....

(1)

(d) Factorise fully $x^2y + xy^2$

.....

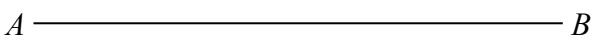
(2) **Q16**

(Total 6 marks)

Leave blank

17. Use ruler and compasses to **construct** the perpendicular bisector of the line *AB*.

You must show all your construction lines.



Q17

(Total 2 marks)

Leave blank

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

.....

(3)

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

.....

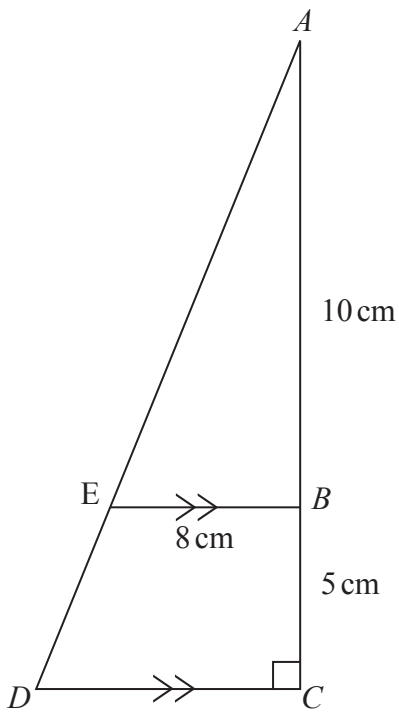
(3)

Q18

(Total 6 marks)

Leave blank

19.



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*.

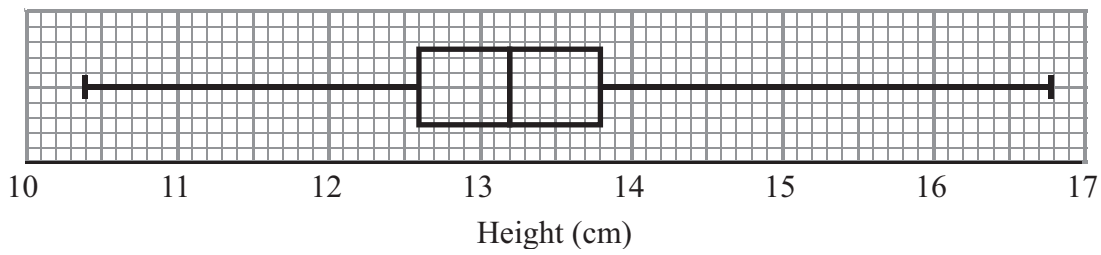
.....cm^2
(2)

Q19

(Total 4 marks)

Leave blank

20. Mr Green measured the height, in cm, of each tomato plant in his greenhouse.
He used the results to draw the box plot shown below.



(a) Write down the median height.

.....cm
(1)

(b) Work out the interquartile range.

.....cm
(2)

(c) Explain why the interquartile range may be a better measure of spread than the range.

.....

.....

(1)

(Total 4 marks)

Q20

Leave blank

21. Solve the simultaneous equations

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

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

(Total 4 marks)

Q21

Leave blank

22.

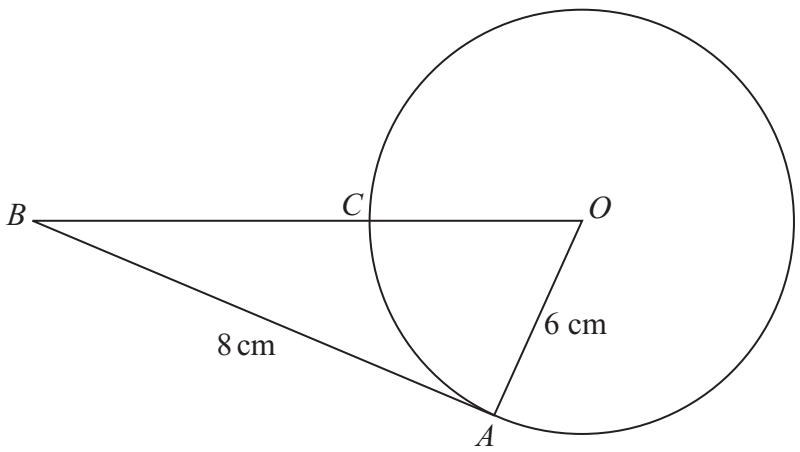


Diagram **NOT** accurately drawn

In the diagram, O is the centre of the circle.
A and C are points on the circumference of the circle.
BCO is a straight line.
BA is a tangent to the circle.

$AB = 8$ cm.
$OA = 6$ cm.

(a) Explain why angle OAB is a right angle.

.....

.....

(1)

(b) Work out the length of BC.

.....cm

(3)

(Total 4 marks)

Q22

Turn over

Leave blank

23. (a) Expand and simplify $(x - 3)(x + 5)$

.....

(2)

(b) Solve $x^2 + 8x - 9 = 0$

.....

(3)

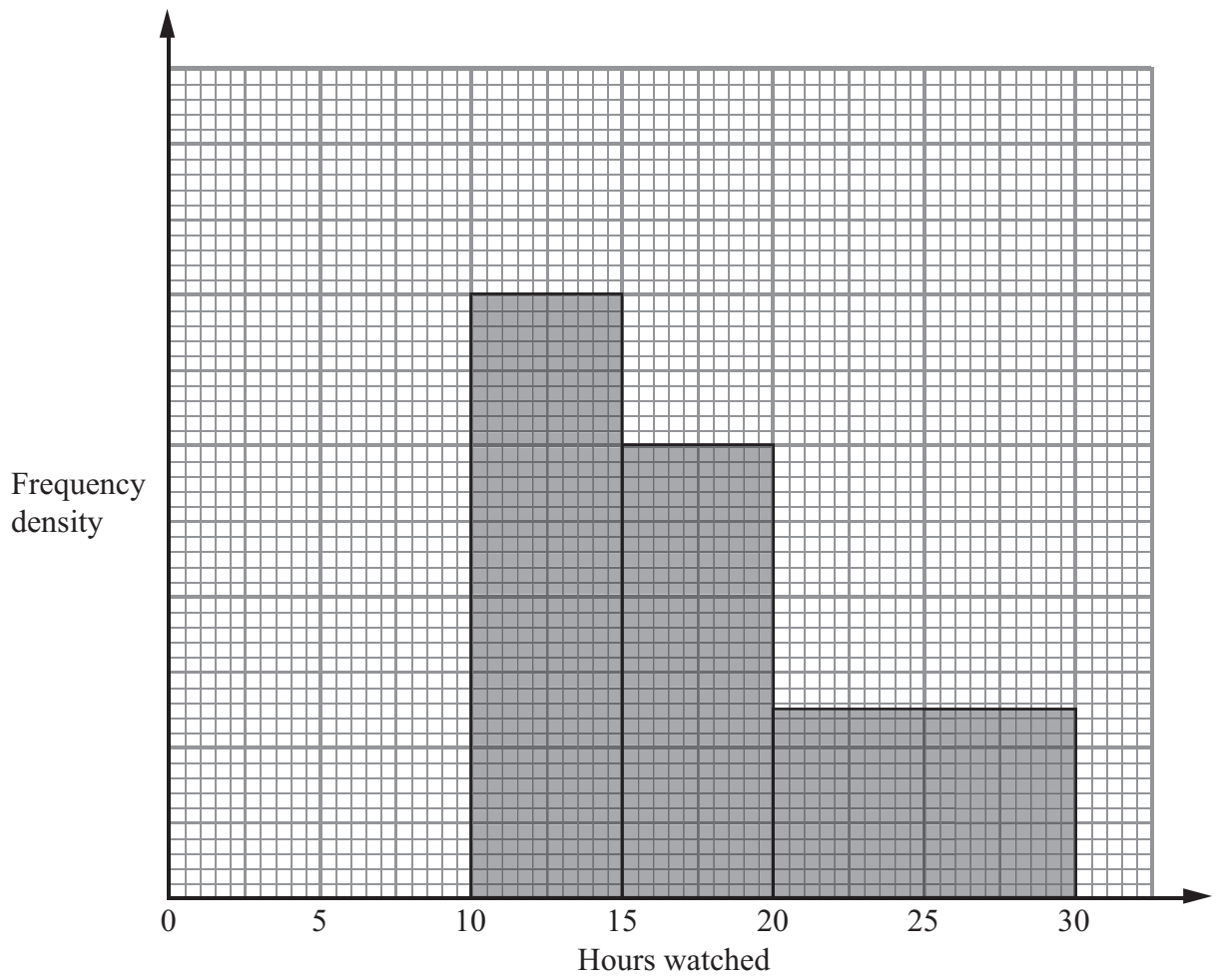
Q23

(Total 5 marks)

Leave blank

24. Tom asked the students in his class how many hours they watched television last week.

The incomplete histogram was drawn using his results.



Eight students watched television for between 10 and 15 hours.
Six students watched television for between 0 and 10 hours.

(a) Use this information to complete the histogram.

(2)

No students watched television for more than 30 hours.

(b) Work out how many students Tom asked.

.....

(2)

Q24

(Total 4 marks)

Leave blank

25. The table shows information about the ages, in years, of 1000 teenagers.

Age (years)	13	14	15	16	17	18	19
Number of teenagers	158	180	165	141	131	115	110

Simone takes a sample of 50 of these teenagers, stratified by age.

Calculate the number of 14 year olds she should have in her sample.

.....

(Total 2 marks)

Q25

26. 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)

(Total 4 marks)

Q26

Leave blank

27.

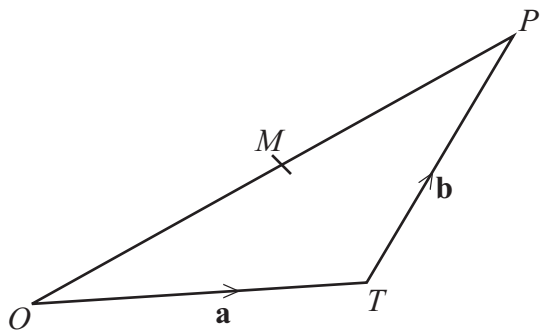


Diagram **NOT** accurately drawn

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)

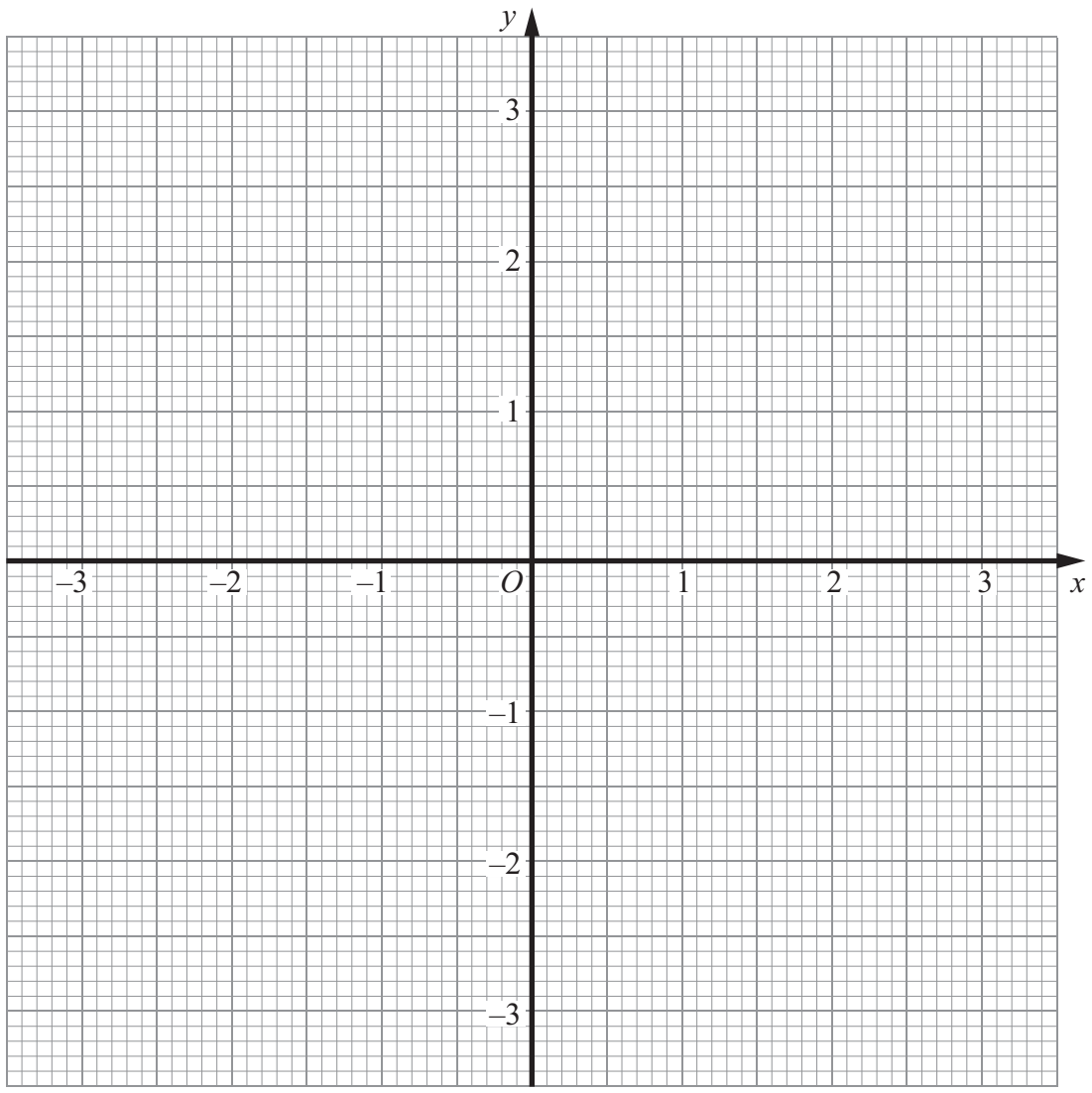
Q27

(Total 4 marks)

Turn over

Leave blank

28. (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 $x^2 + y^2 = 9$ and $x + y = 1$

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

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

(3)

(Total 5 marks)

Q28

TOTAL FOR PAPER: 100 MARKS

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