Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						1	3	8	0	/	4	H	Signature	

Paper Reference(s)

1380/4H

Examiner's use only

Team Leader's use only

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 4 (Calculator)

Higher Tier

Tuesday 10 November 2009 – Morning

Time: 1 hour 45 minutes

Materials required for examination
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. 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 29 questions in this question paper. The total mark for this paper is 100.
There are 24 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.

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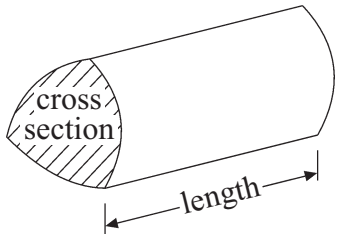
GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

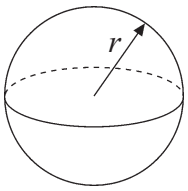
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



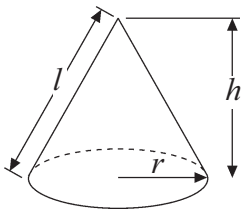
Volume of sphere $= \frac{4}{3}\pi r^3$

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

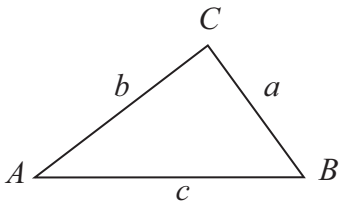


Volume of cone $= \frac{1}{3}\pi r^2 h$

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



In any triangle ABC



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

The Quadratic Equation

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

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

Leave blank

Answer ALL TWENTY NINE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Ali asked 200 students which sport they like best.
They could choose swimming or tennis or athletics.

The two-way table shows some information about their answers.

	Swimming	**Tennis**	**Athletics**	**Total**
Female			19	
Male	36	42		
Total	79		54	200

Complete the two-way table.

Q1

(Total 3 marks)

2. (a) Use your calculator to work out the value of $\frac{8.7\times12.3}{9.5-5.73}$

Write down all the digits from your calculator.
Give your answer as a decimal.

.....

(2)

(b) Write your answer to part (a) correct to 1 significant figure.

.....

(1)

Q2

(Total 3 marks)

Leave blank

3. (a) $p = 2$
$q = -4$

Work out the value of $3p + 5q$

.....
(2)

(b) Factorise $3m - 6$

.....
(1)

Q3

(Total 3 marks)

4. Frank did a survey on the areas of pictures in a magazine.

The magazine had 60 pages.
Frank worked out the area of each of the pictures in the first 2 pages.

This may not be a good method to do the survey.
Explain why.

.....

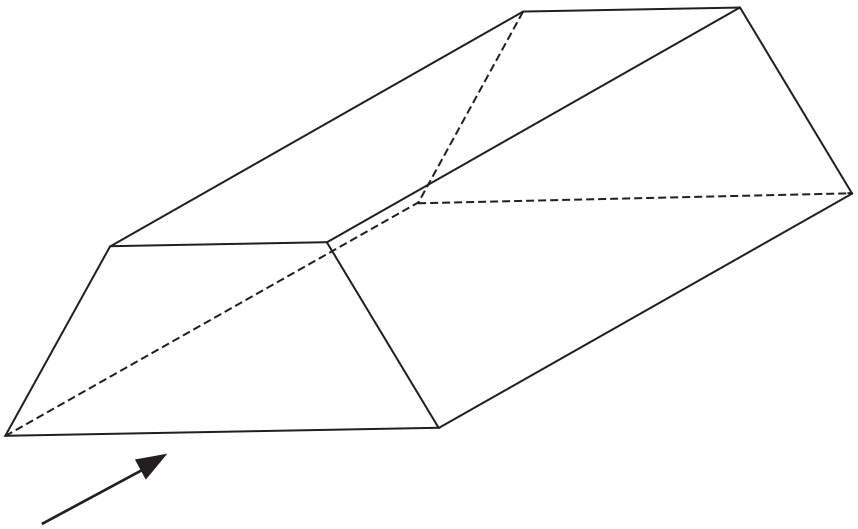
.....

Q4

(Total 1 mark)

Leave blank

5.



The diagram shows a prism.

(a) On the diagram, draw in **one** plane of symmetry for the prism.

(2)

(b) In the space below, sketch the front elevation from the direction marked with an arrow.

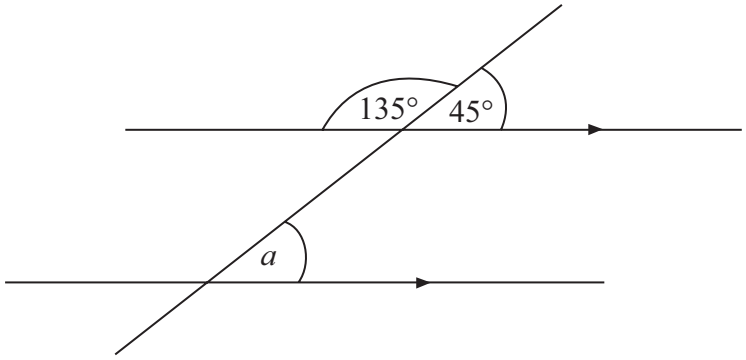
(2) **Q5**

(Total 4 marks)

Leave blank

6.

Diagram **NOT** accurately drawn



(i) Write down the size of the angle marked *a*.

..... °

(ii) Give a reason for your answer.

.....

Q6

(Total 2 marks)

7. A circle has a radius of 5 cm.

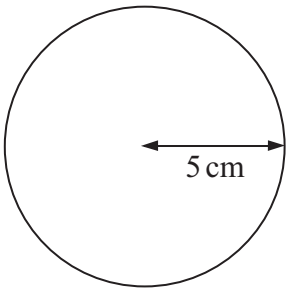


Diagram **NOT** accurately drawn

Work out the area of the circle.
Give your answer correct to 3 significant figures.

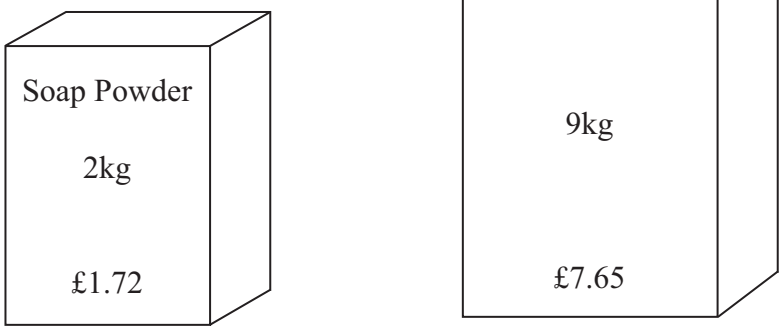
..... cm^2

Q7

(Total 2 marks)

Leave blank

8. Soap powder is sold in two sizes of box.



Small box Large box

A small box contains 2 kg of soap powder and costs £1.72
A large box contains 9 kg of soap powder and costs £7.65

Which size of box gives the better value for money?

.....

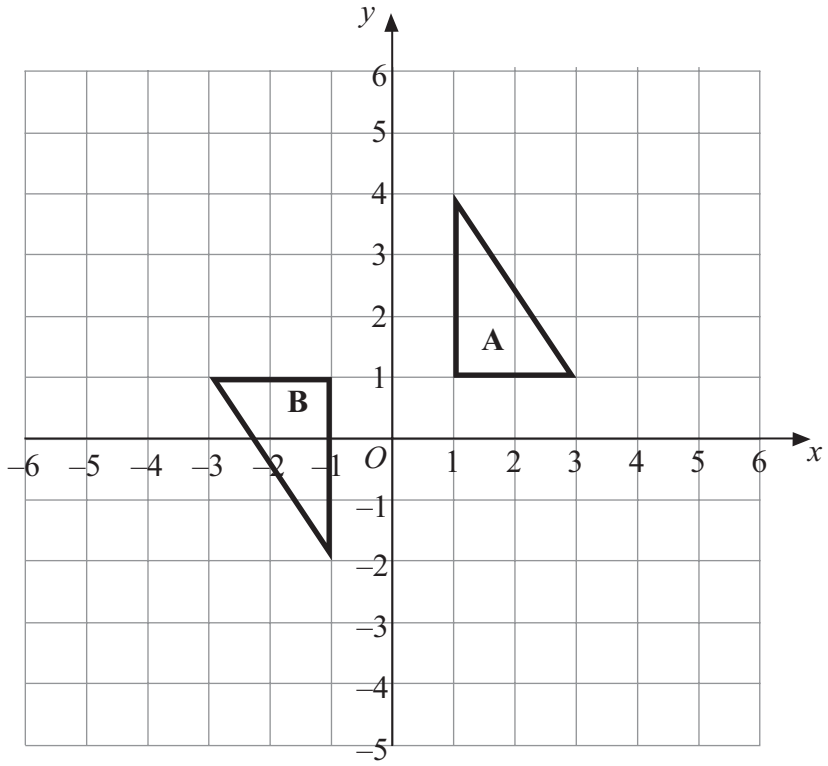
Explain your answer.
You must show all your working.

Q8

(Total 3 marks)

Leave blank

9.



Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....

.....

Q9

(Total 3 marks)

10. A computer costs £360 plus $17\frac{1}{2}$% VAT.

Calculate the total cost of the computer.

£360

plus

$17\frac{1}{2}$% VAT

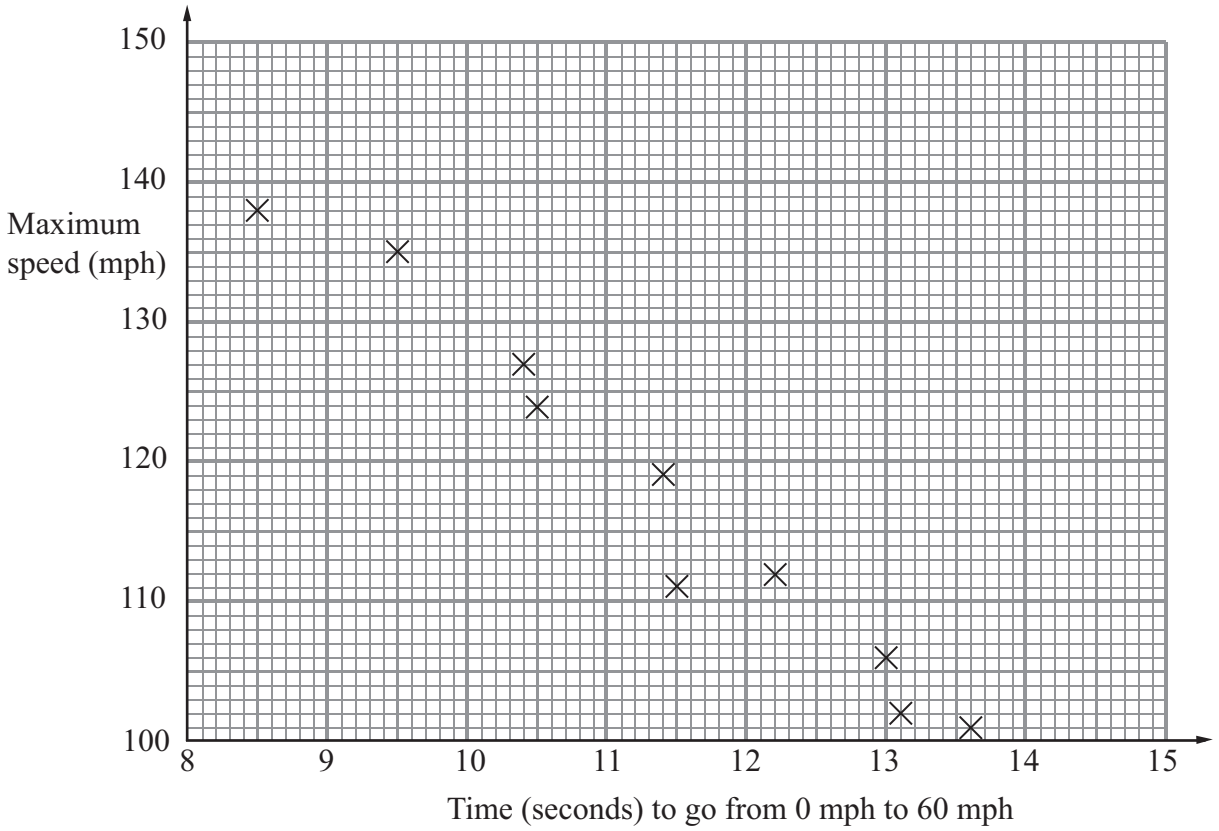
£ .....

Q10

(Total 3 marks)

Leave blank

11. The scatter graph shows some information about 10 cars.
It shows the time, in seconds, it takes each car to go from 0 mph to 60 mph.
For each car, it also shows the maximum speed, in mph.



(a) What type of correlation does this scatter graph show?

.....

(1)

The time a car takes to go from 0 mph to 60 mph is 11 seconds.

(b) Estimate the maximum speed for this car.

..... mph

(2)

Q11

(Total 3 marks)

Leave blank

12.

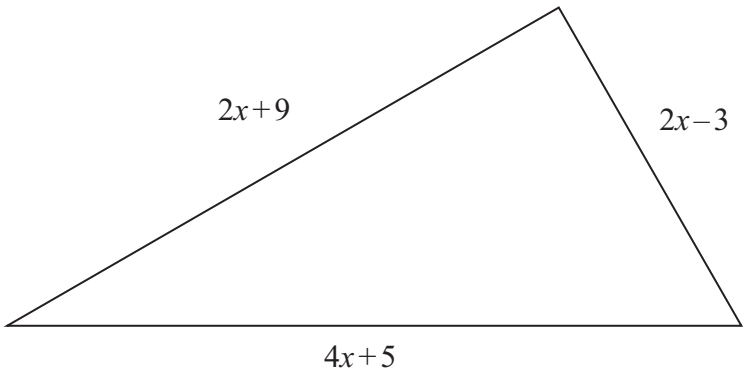


Diagram **NOT** accurately drawn

In the diagram, all measurements are in centimetres.

The lengths of the sides of the triangle are

$2x+9$
$2x-3$
$4x+5$

(a) Find an expression, in terms of x, for the perimeter of the triangle.
Give your expression in its simplest form.

.....

(2)

The perimeter of the triangle is 39 cm.

(b) Find the value of x.

$x =$ .....

(2)

Q12

(Total 4 marks)

Leave blank

13. A piece of wood is 180 cm long.
Tom cuts it into three pieces in the ratio 2 : 3 : 4

Work out the length of the longest piece.

..... cm

Q13

(Total 3 marks)

14. The equation

$$x^3 + 2x = 60$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

x = ...

Q14

(Total 4 marks)

Leave blank

15. (a) Simplify $m^3 \times m^4$

.....

(1)

(b) Simplify $p^7 \div p^3$

.....

(1)

(c) Simplify $4x^2y^3 \times 3xy^2$

.....

(2) **Q15**

(Total 4 marks)

16.

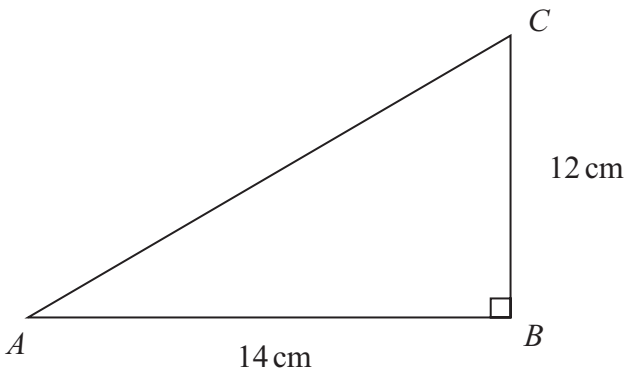


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
AB = 14 cm.
BC = 12 cm.

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

..... cm **Q16**

(Total 3 marks)

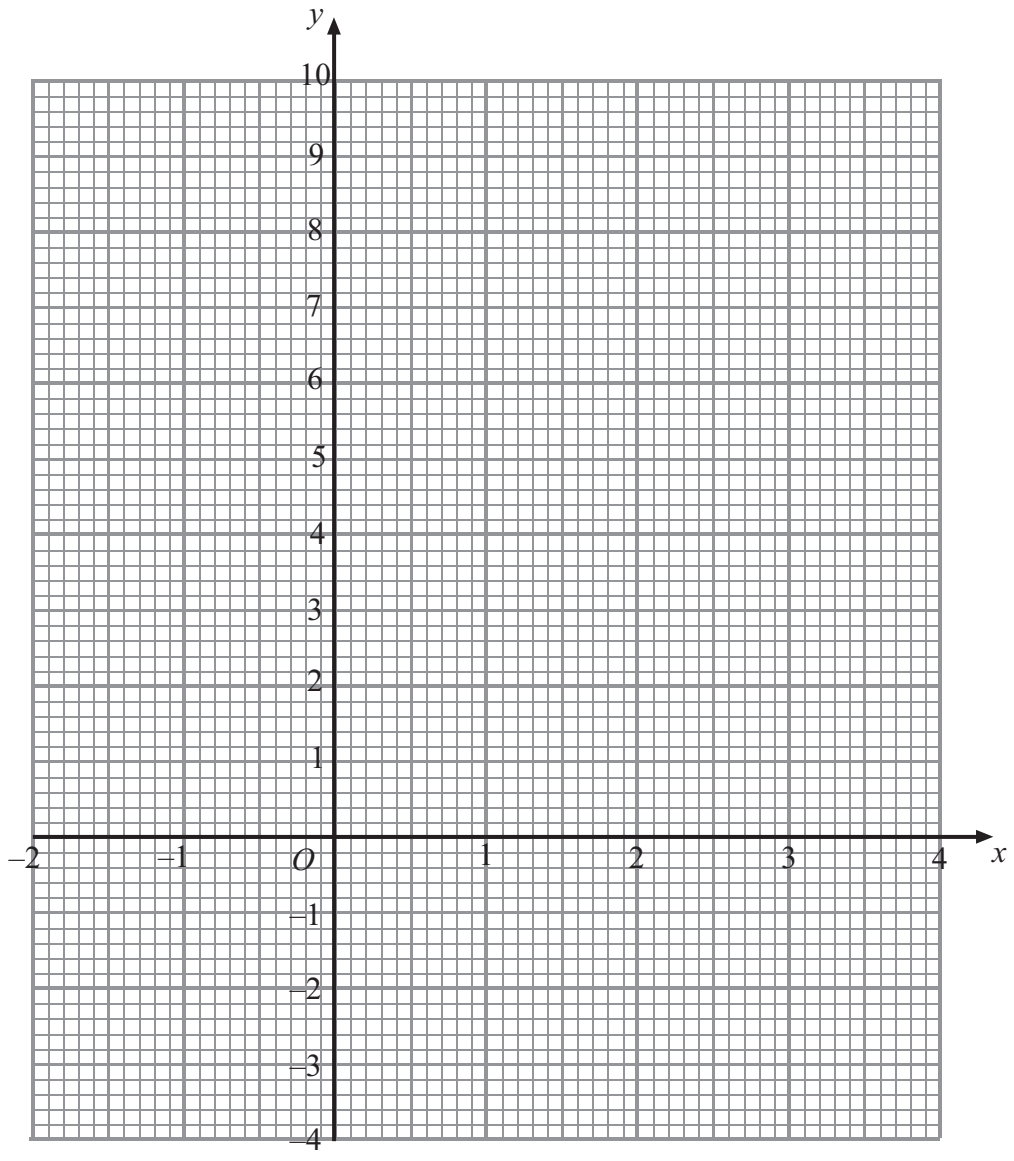
Leave blank

17. (a) Complete the table of values for $y = x^2 - 3x - 1$

x	–2	–1	0	1	2	3	4
y		3	–1	–3		–1	

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x - 1$ for values of x from – 2 to 4



(2) **Q17**

(Total 4 marks)

Leave blank

18. The table shows some information about the heights (h cm) of 100 students.

Height (h cm)	**Frequency**		
$120 \leqslant h < 130$	8		
$130 \leqslant h < 140$	16		
$140 \leqslant h < 150$	25		
$150 \leqslant h < 160$	30		
$160 \leqslant h < 170$	21		

(a) Find the class interval in which the median lies.

.....

(1)

(b) Work out an estimate for the mean height of the students.

..... cm

(4)

Q18

(Total 5 marks)

Leave blank

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

.....

(2)

(b) Solve $\frac{29-x}{4} = x+5$

$x =$ .....

(3)

Q19

(Total 5 marks)

20. The table gives information about the cost of the gas used by a family.

Month	Jan-Mar 2007	Apr-Jun 2007	Jul-Sep 2007	Oct-Dec 2007	Jan-Mar 2008	Apr-Jun 2008	Jul-Sep 2008
Cost of gas (in £)	124	63	24	121	136	71	32

(a) Work out the four-point moving averages for this information.
The first three have been worked out for you.

£83 ..... £86 ..... £88 ..... £.....

(2)

(b) Use the moving averages to describe the trend.

.....

(1)

Q20

(Total 3 marks)

Leave blank

21. In a sale, normal prices are reduced by 12%.
The sale price of a digital camera is £132.88

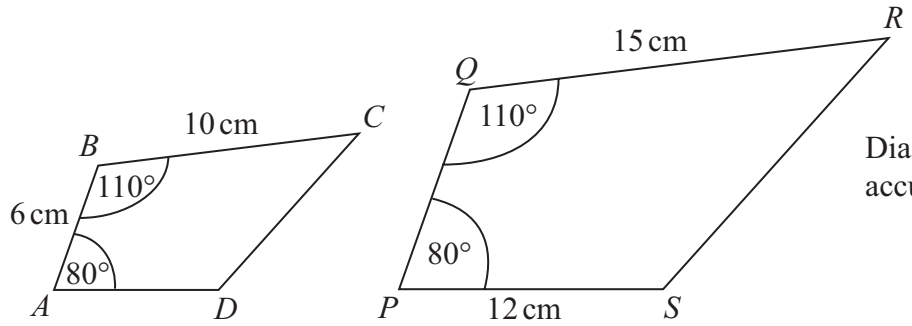
Work out the normal price of the digital camera.

£ .....

(Total 3 marks)

Q21

22.



Diagrams **NOT** accurately drawn

ABCD and *PQRS* are mathematically similar.

(a) Find the length of *PQ*.

..... cm

(2)

(b) Find the length of *AD*.

..... cm

(2)

(Total 4 marks)

Q22

Leave blank

23.

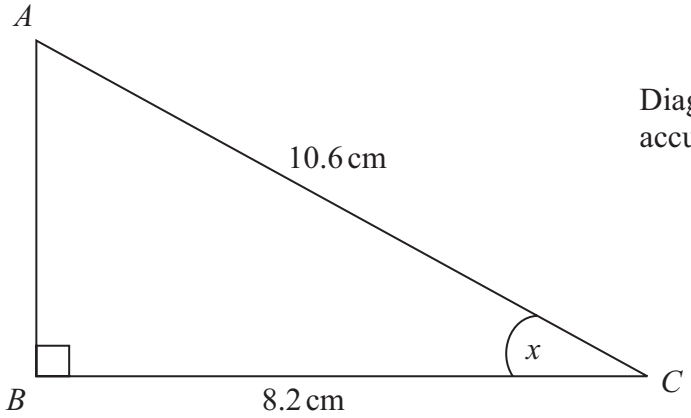


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
AC = 10.6 cm.
BC = 8.2 cm.

Calculate the size of the angle marked *x*.
Give your answer correct to 3 significant figures.

..... °

Q23

(Total 3 marks)

Leave blank

24. The table below gives some information about some students in a school.

Year group	Boys	Girls	Total
Year 12	126	94	220
Year 13	77	85	162
Total	203	179	382

Andrew is going to carry out a survey of these students.
He uses a sample of 50 students, stratified by year group and gender.

Work out the number of Year 13 girls that should be in his sample.

.....

(Total 2 marks)

Q24

25. y is directly proportional to x.

When $x = 500$, $y = 10$

(a) Find a formula for y in terms of x.

$y =$ .....

(3)

(b) Calculate the value of y when $x = 350$

$y =$ .....

(1)

(Total 4 marks)

Q25

Leave blank

26.

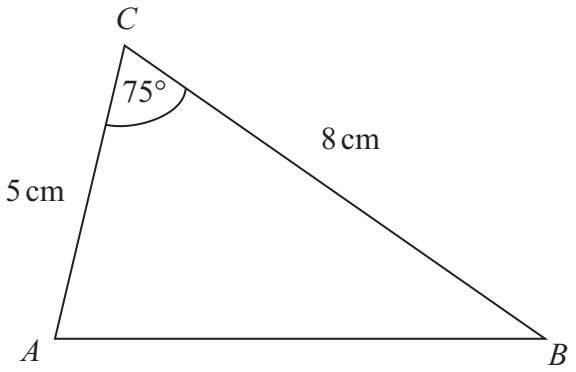


Diagram **NOT** accurately drawn

In triangle ABC,

$AC = 5$ cm.
$BC = 8$ cm.
Angle $ACB = 75°$.

(a) Calculate the area of triangle ABC.
Give your answer correct to 3 significant figures.

..... cm^2
(2)

(b) Calculate the length of AB.
Give your answer correct to 3 significant figures.

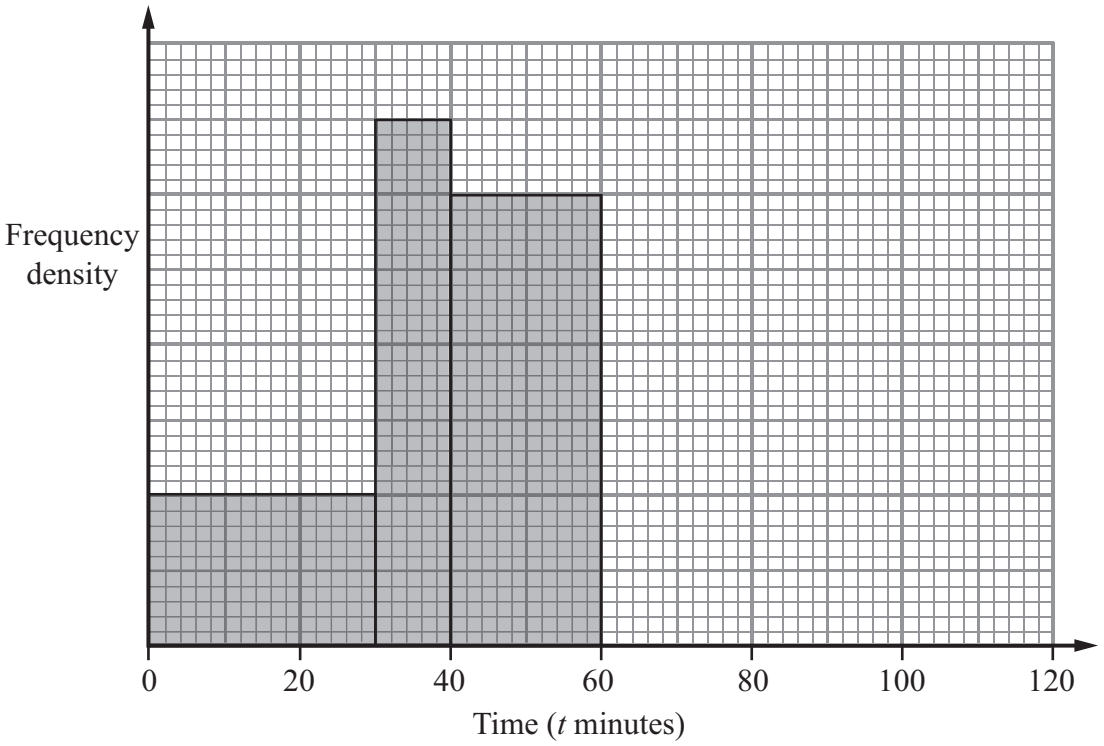
..... cm
(3)

Q26

(Total 5 marks)

Leave blank

27. The incomplete histogram and table give some information about the times, in minutes, that cars were parked in a car park.



(a) Use the information in the histogram to complete the frequency table.

Time (t minutes)	Frequency
$0 < t \leqslant 30$	
$30 < t \leqslant 40$	35
$40 < t \leqslant 60$	
$60 < t \leqslant 80$	30
$80 < t \leqslant 120$	20

(2)

(b) Use the information in the table to complete the histogram.

(2)

(Total 4 marks)

Q27

Leave blank

28.

$v = \sqrt{\frac{a}{b}}$

a = 6.43 correct to 2 decimal places.
b = 5.514 correct to 3 decimal places.

By considering bounds, work out the value of v to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

$v =$ .....

Q28

(Total 5 marks)

Leave blank

29. Solve $\frac{4}{x+3}+\frac{3}{2x-1}=1$

Q29

.....

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

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