Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
TOTAL	

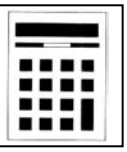
General Certificate of Secondary Education
Foundation Tier

Methods in Mathematics (Linked Pair Pilot) 93652F

Unit 2 Foundation Tier

Specimen Paper

F

For this paper you must have:	
• a calculator • mathematical instruments.	

Time allowed
- 1 hour 30 minutes

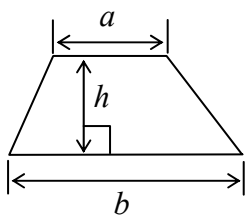
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in questions 9 and 14.
  These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper.
  These must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

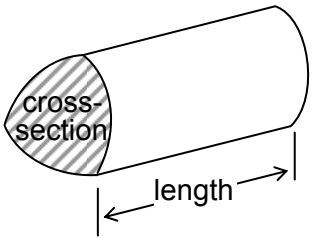
Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a+b)h$



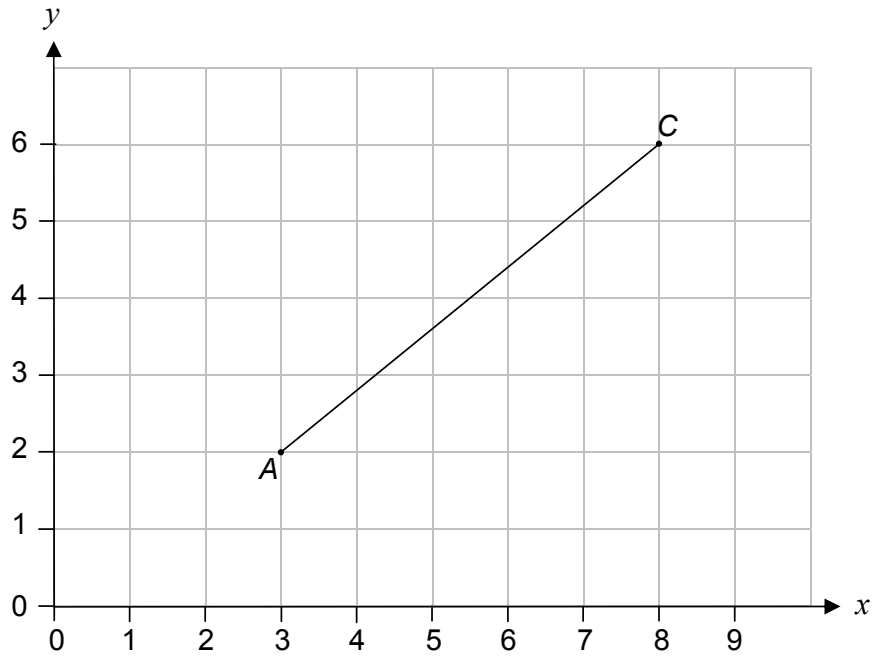
Volume of prism = area of cross-section × length



Do not write outside the box

Answer **all** questions in the spaces provided.

1 *AC* is drawn on the grid.



1 (a) Write down the coordinates of *C*.

Answer (....., ...) *(1 mark)*

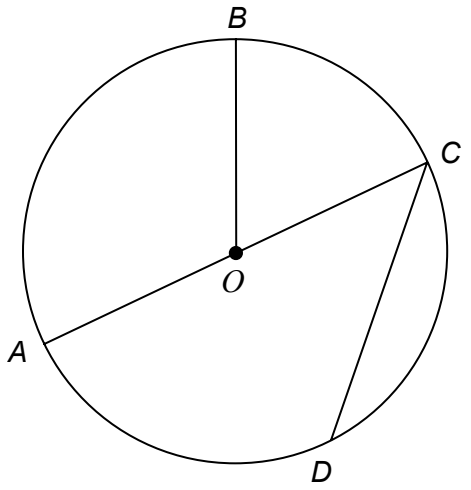
1 (b) *AC* is the **diagonal** of rectangle *ABCD*.

Draw rectangle ABCD on the grid.

(1 mark)

2

2 *A*, *B*, *C* and *D* are four points on a circle centre O.



2 (a) Here are five words that are used with circles.

circumference **radius** **chord** **diameter** **sector**

Use **one** of these words to complete the following sentences.

2 (a) (i) The straight line *AC* is a ..... of the circle.

(1 mark)

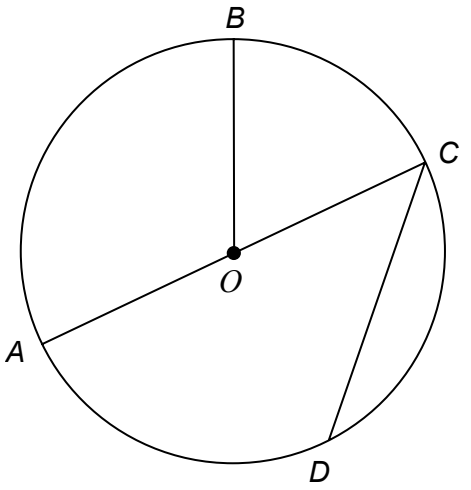
2 (a) (ii) The straight line *CD* is a ..... of the circle.

(1 mark)

2 (a) (iii) The straight line *OB* is a ..... of the circle.

(1 mark)

2 (b) On the diagram below draw a tangent to the circle at point *A*.



(1 mark)

Do not write outside the box

3 Here is a list of numbers

4020 2040 2400 2004 4200 4002

3 (a) From the list, write down the smallest number.

Answer ..... *(1 mark)*

3 (b) From the list, write down the largest number.

Answer ..... *(1 mark)*

3 (c) From the list, write down the number that is nearest to 3000

Answer ..... *(1 mark)*

3 (d) Write the number 4020 in words.

Answer ..... *(1 mark)*

4 (a) Write down all the factors of 10

.....

.....

.....

Answer ..... *(2 marks)*

4 (b) (i) Round 6794 to the nearest 10

.....

Answer ..... *(1 mark)*

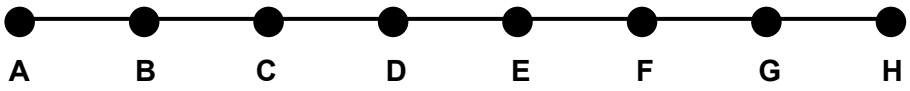
4 (b) (ii) Round 6794 to the nearest 100

.....

Answer ..... *(1 mark)*

12

5 The diagram shows a bus route from A to H.
Each letter is a bus stop.



The bus starts from A where 5 passengers get on.
At B, 1 passenger gets off and 7 get on.
At C, 2 passengers get off and 9 get on.
At D, 3 passengers get off and 11 get on.
This pattern continues until G.

How many passengers are on the bus when it arrives at H?

.....

.....

.....

.....

.....

Answer ..... *(3 marks)*

Do not write outside the box

6 (a) Draw an acute angle.
Mark your angle clearly.

(1 mark)

6 (b) Draw an obtuse angle.
Mark your angle clearly.

(1 mark)

6 (c) Draw a quadrilateral which has a reflex angle.
Mark the reflex angle clearly.

(2 marks)

7

7 Sandra buys cinema tickets for herself and three friends.
She pays with a £20 note and gets £1.20 change.
Each friend pays her back for their ticket.

How much **in total** does she get back from her friends?

.....

.....

.....

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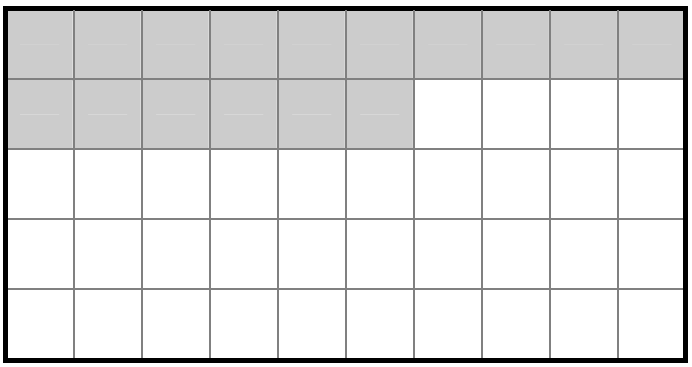
.....

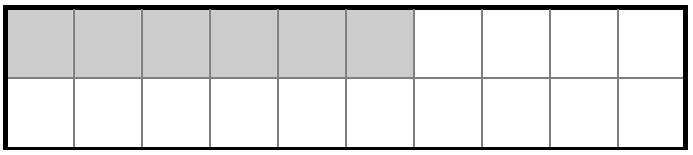
Answer £ ..... *(3 marks)*

✳ **8** A and B are two rectangles, each with a certain proportion shaded.

A



B



Which diagram has the greater proportion shaded?

You **must** show working to justify your answer.

.....

.....

.....

.....

Answer ..... *(4 marks)*

9 (a) A sequence starts 3 7 11 15 .....

9 (a) (i) Write down the next term in the sequence.

Answer ..... *(1 mark)*

9 (a) (ii) Write down a rule for continuing the sequence.

Answer ..... *(1 mark)*

9 (b) Another sequence starts 13 11 9 7 .....

How many terms of this sequence are positive numbers?

.....

Answer ..... *(2 marks)*

9 (c) A different sequence starts 6 9 15 .....

Beth and Zak are making up rules to work out the next number of this sequence.

9 (c) (i) Beth's rule is

Multiply the last term by 2 and subtract 3

Write down Beth's next term.

.....

Answer ..... *(1 mark)*

9 (c) (ii) Zak's rule is

Take each prime number in turn and multiply by 3

Write down Zak's next term.

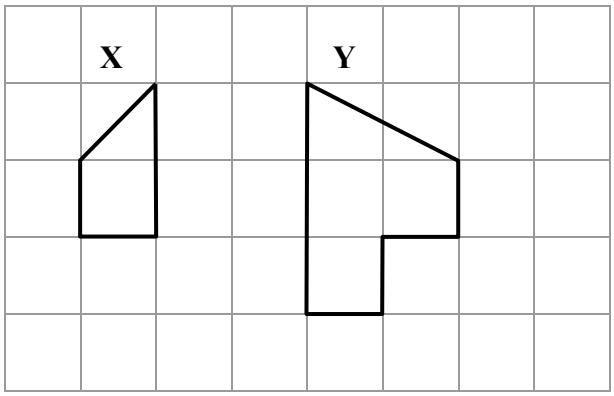
.....

Answer ..... *(1 mark)*

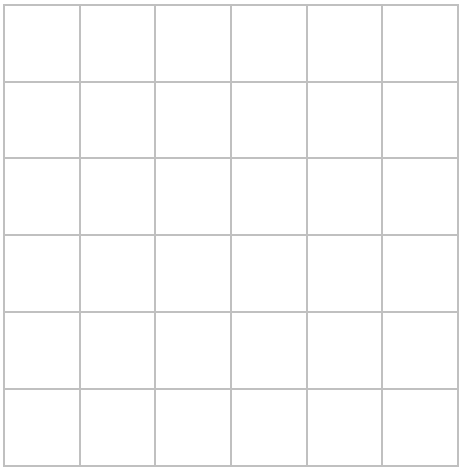
13

10 This question is about shapes drawn on a centimetre grid with horizontal and vertical lines and **one** sloping line.

Two examples X and Y are shown.



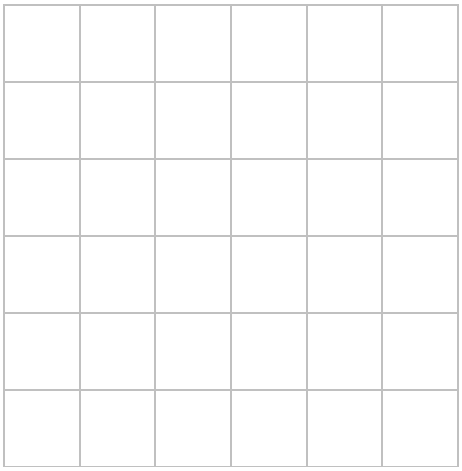
10 (a) Draw a different shape using horizontal and vertical lines and **one** sloping line.



(1 mark)

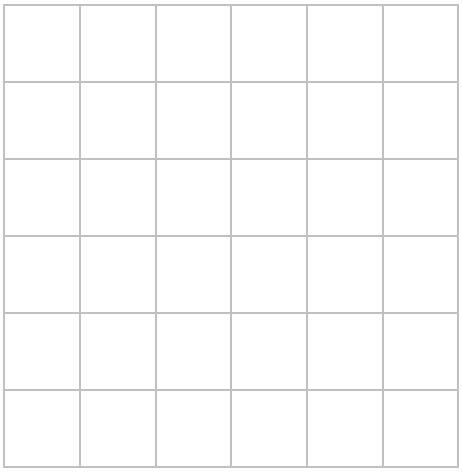
10 (b) Shape X has four vertices and shape Y six vertices.

Draw a shape using horizontal and vertical lines and **one** sloping line with five vertices.



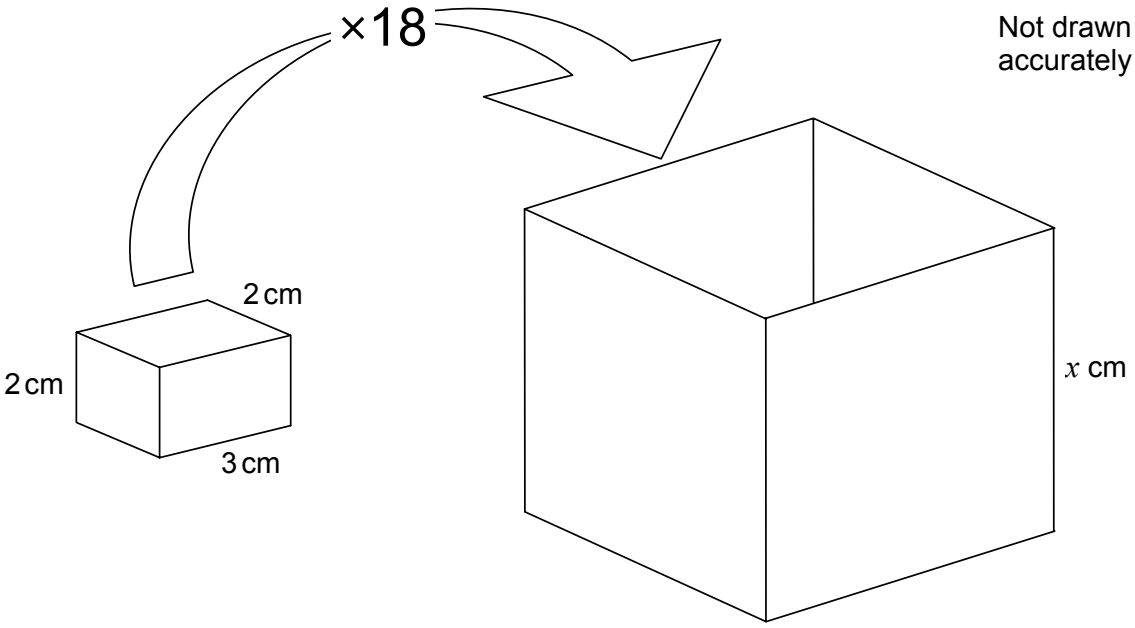
(2 marks)

10 (c) Draw a shape using horizontal and vertical lines and **one** sloping line with an area of 6 cm^2.



(2 marks)

11 A cuboid is 2 cm by 2 cm by 3 cm.



18 of these cuboids are to be packed into a box in the shape of a cube.

What is the length of the side of the cube, x?

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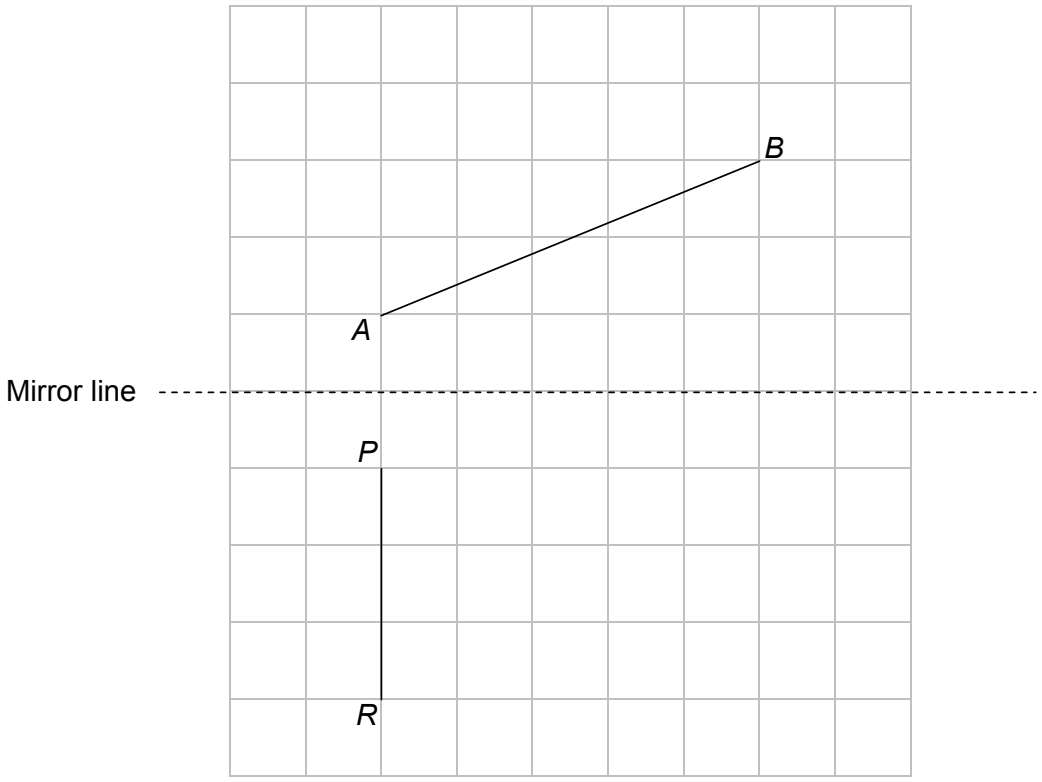
.....

.....

Answer..... *(3 marks)*

8

12 *AB* is one side of a triangle *ABC*.
PR is one side of triangle *PQR*.



The triangle PQR is a reflection of the triangle ABC in the mirror line.

Complete the diagram to show both triangles.

(2 marks)

13 (a) (i) Solve $x - 5 = 8$

.....

Answer $x =$ ..... *(1 mark)*

13 (a) (ii) Solve $\frac{x}{2} = 6$

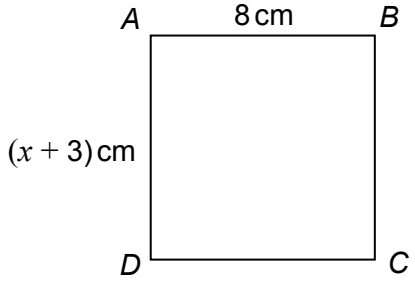
.....

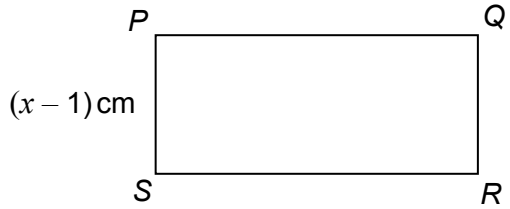
Answer $x =$ ..... *(1 mark)*

✶ **13 (b)** *ABCD* is a square.

PQRS is an oblong.

Not drawn accurately





The oblong and the square have the same perimeter.

Work out the length of *PQ*.

Show clearly how you work out your answer.

.....

.....

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.....

Answer ..... cm *(4 marks)*

14 1936 was a square year, because the number 1936 is a square number.
Harry was born in 1936.
He hopes to be alive in the next square year.

How old will he be then?

.....

.....

Answer ..... *(3 marks)*

11

15 Here are some expressions on cards.

A	B	C	D
$x + y$	$5x - y$	$3x + 2y$	$4x + 3y$

15 (a) Which **two** cards add together to give the expression on card D?

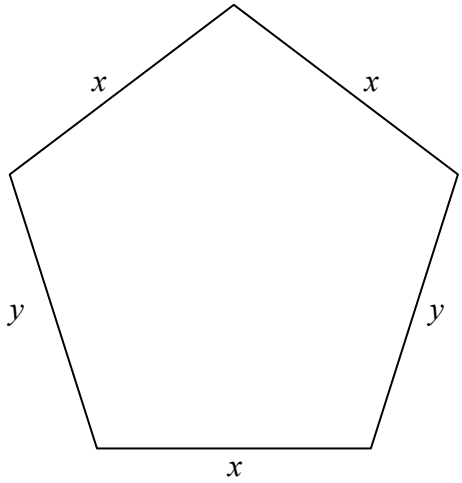
.....

.....

.....

Answer ..... and ..... *(1 mark)*

15 (b) Which of the cards shows the perimeter of this pentagon?



Answer ..... *(1 mark)*

15 (c) Gina says that when x and y are whole numbers, the sum of the expressions on cards A and B is always a multiple of 3.

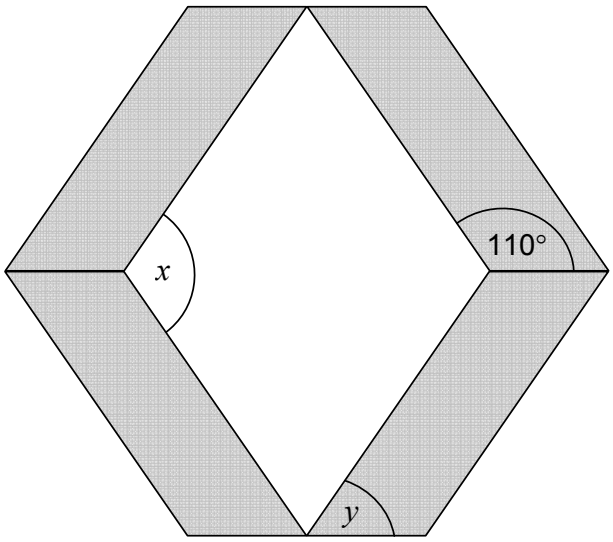
Show that she is correct.

.....

.....

(2 marks)

16 Four identical parallelograms are joined to form this pattern.



Not drawn accurately

Work out the sizes of the angles marked x and y.

.....

.....

.....

.....

Answer $x =$ ..... degrees, $y =$ ..... degrees *(3 marks)*

17 A circle has radius 4.2 centimetres.

Work out the area.

.....

.....

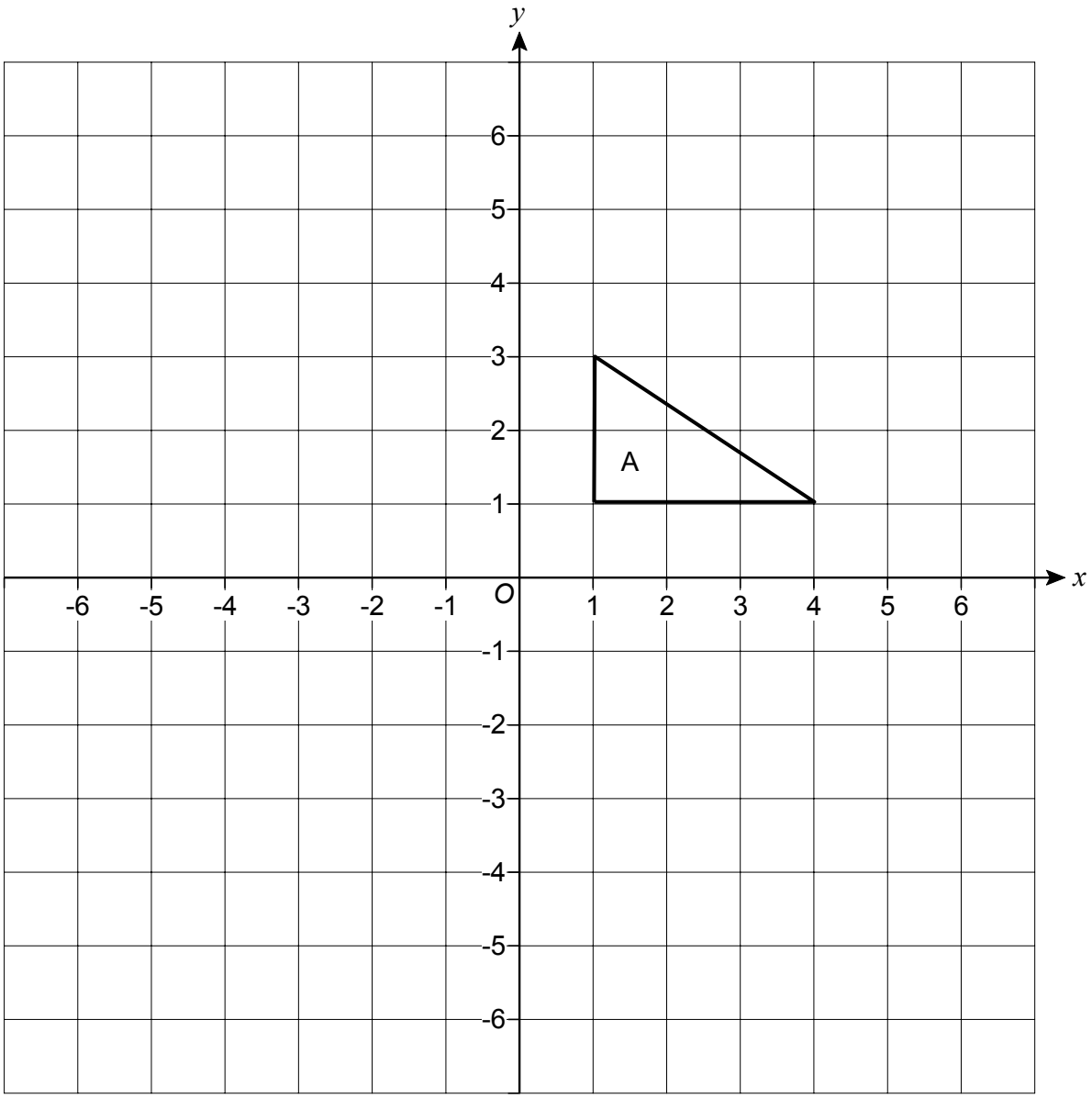
.....

.....

Answer ..... cm^2 *(2 marks)*

9

18 Rotate triangle A, 90° clockwise, about the origin.



(3 marks)

19 Use your calculator to evaluate $\dfrac{6.1 \times 5.9}{8.7 - 3.4}$

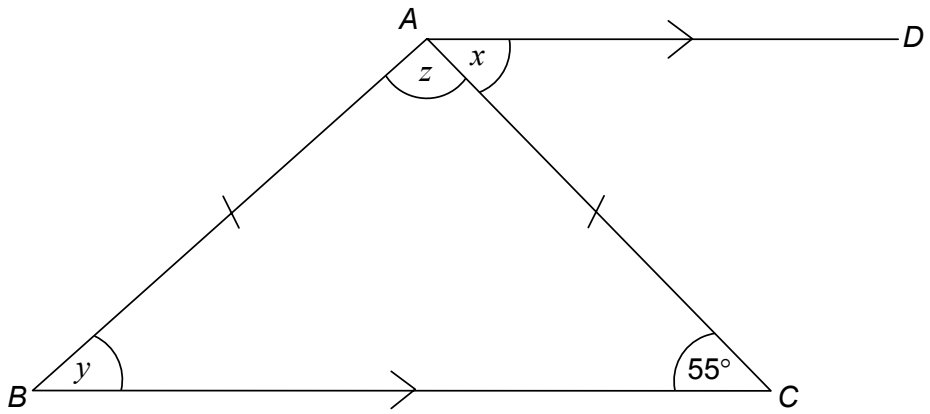
19 (b) Write down your full calculator display.

Answer ..... *(1 mark)*

19 (c) Write down your answer to 1 decimal place.

Answer ..... *(1 mark)*

20 *ABC* is an isosceles triangle with $AB = AC$.
BC is parallel to *AD* and angle $BCA = 55°$



Not drawn accurately

Work out the sizes of the angles marked x, y and z.

.....

.....

Answer $x =$ ..... degrees

$y =$ ..... degrees

$z =$ ..... degrees

(4 marks)

9

21 In a class of 30 pupils

16 have a mobile phone and a computer.
27 have a mobile phone.
17 have a computer.

Work how many pupils do **not** have a mobile phone or a computer.

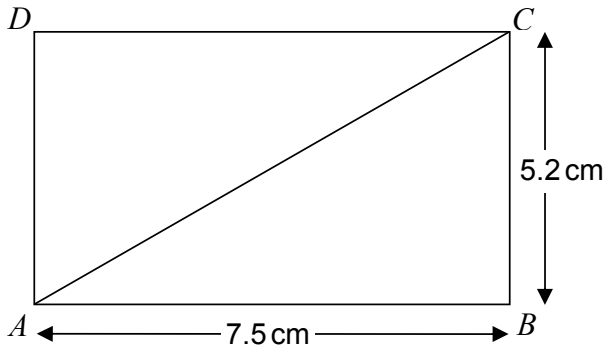
.....

.....

Answer ..... *(3 marks)*

22 *ABCD* is a rectangle.

AB = 7.5 cm and *BC* = 5.2 cm.



Not drawn accurately

Calculate the length of the diagonal, *AC*.

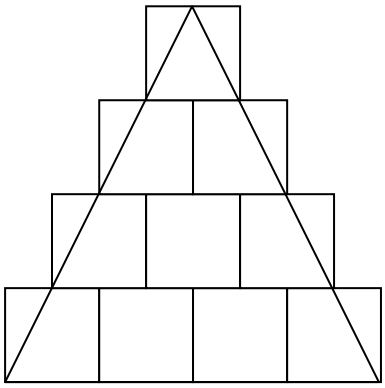
.....

.....

.....

Answer ..... cm *(3 marks)*

23 This shape consists of 10 equal squares.



What fraction of the shape is covered by the triangle?

.....

.....

.....

Answer.....

(3 marks)

END OF QUESTIONS

9

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED