A screenshot of a cell phone

Description automatically generated

**Foundation Tier**

**Algebraic proof**

**Instructions**

* Use **black** ink or ball-point pen.
  + **Fill in the boxes** at the top of this page with your name,  
    centre number and candidate number.
* Answer **all** questions.
* Answer the questions in the spaces provided  
  *– there may be more space than you need.*
* You must **show all your working.**
* Diagrams are **NOT** accurately drawn, unless otherwise indicated.
* If your calculator does not have a *π* button, take the value of *π* to be3.142

unless the question instructs otherwise.

**Information**

* The total mark for this paper is **15**. There are **4** questions.
* Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
* The marks for **each** question are shown in brackets  
  *– use this as a guide as to how much time to spend on each question.*

**Advice**

* Read each question carefully before you start to answer it.
* Keep an eye on the time.
* Try to answer every question.
* Check your answers if you have time at the end.

**1** The diagram shows a pentagon.

The pentagon has one line of symmetry.

**

*AE* = 4*x*

*AB* = 2*x* + 1

*BC* = *x* + 2

All these measurements are given in centimetres.

The perimeter of the pentagon is 18 cm.

(*a*)Show that 10*x* + 6 = 18

**(3)**

(*b*)Find the value of *x*.

*x* = .......................................................

**(2)**

**(Total for Question 1 is 5 marks)**

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**2** *a* and *b* are odd numbers.

(*a*)Give an example to show that the value of 2(*a* + *b*) is a multiple of 4.

**(2)**

(*b*)Show that, when *a* and *b* are both odd numbers, the value of 2(*a* + *b*) will always be a multiple of 4.

**(2)**

**(Total for Question 2 is 4 marks)**

**3**



The area of square *ABCD* is 10 cm2.

Show that *x*2 + 6*x* = 1

**(Total for Question 3 is 3 marks)**

**4** Here is a right-angled triangle.



Four of these triangles are joined to enclose the square *ABCD* as shown below.



Show that the area of the square *ABCD* is *x*2 + *y*2

**(Total for Question 4 is 3 marks)**

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**TOTAL MARKS FOR PAPER: 12**