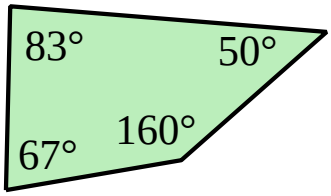
2.1 Irregular Polygons

- A polygon is a “many sided flat shape”
- It has interior (on the inside) angles and exterior (on the outside) angles.

Example

This Quadrilateral has interior angles of 67°, 160°, 50° and 83°

Notice that 67 + 160 + 50 + 83 = 360



- For any polygon the sum of the interior angles depends upon how many sides it has, as shown in the following table;

Polygon's Name	Number of Sides	Interior Angle's Sum
Triangle	3	180
Quadrilateral	4	360
Pentagon	5	540
Hexagon	6	720
Septagon	7	900
Octagon	8	1080
Nonogon	9	1260
Decagon	10	1440

- Here is a formula which some students like to learn that, given the number of sides in a convex polygon, works out the Interior Angle Sum;

Interior Angle Sum (Convex Polygon)

$$IAS = 180\,(n - 2)$$

where *IAS* is the Interior Angle Sum
and *n* is the number of sides

2.2 Exercise

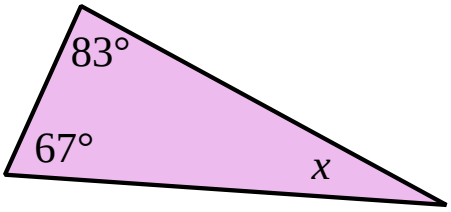
You may use a calculator
Marks Available : 35

Question 1

(i) What do the interior angles of a triangle add up to ?

[1 mark]

(ii) The following triangle is not drawn accurately; it's just a sketch.
Use arithmetic to calculate the unknown angle marked *x*



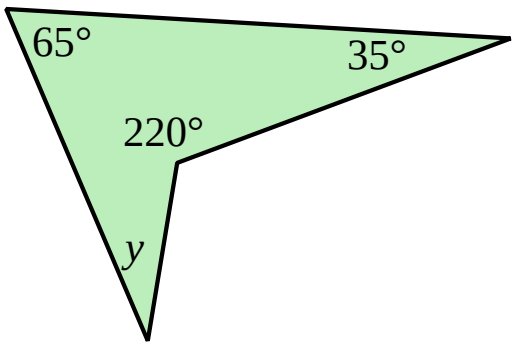
[2 marks]

Question 2

(i) What do the interior angles of a quadrilateral add up to ?

[1 mark]

(ii) The following quadrilateral is not drawn accurately; it's just a sketch.
Use arithmetic to calculate the unknown angle, marked *y*



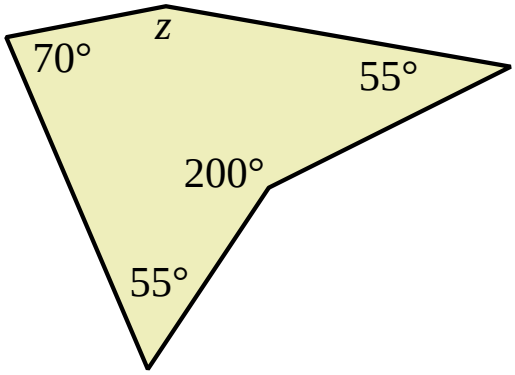
[2 marks]

Question 3

(i) What do the interior angles of a pentagon add up to ?

[1 mark]

(ii) The following pentagon is not drawn accurately; it's just a sketch.
Use arithmetic to calculate the unknown angle, marked *z*



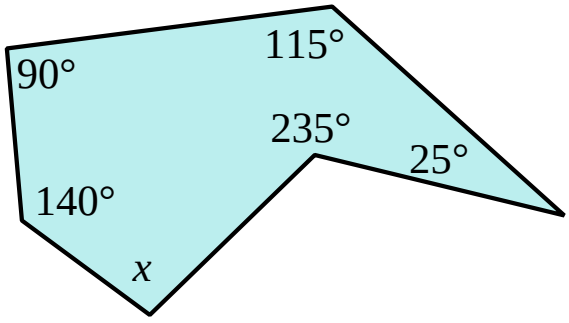
[3 marks]

Question 4

(i) What do the interior angles of a hexagon add up to ?

[1 mark]

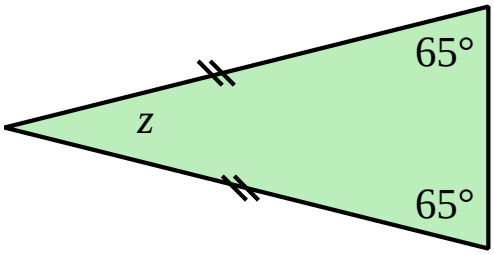
(ii) The following hexagon is not drawn accurately; it's just a sketch.
Use arithmetic to calculate the unknown angle, marked *x*



[3 marks]

Question 5

(i) Find angle z in this isosceles triangle



[2 marks]

(ii) What does the following symbol on the triangle indicate ?

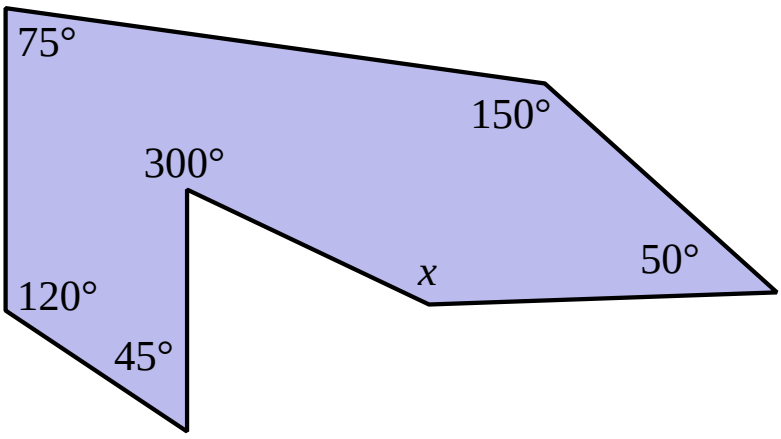
[1 mark]

Question 6

(i) What do the interior angles of a septagon add up to ?

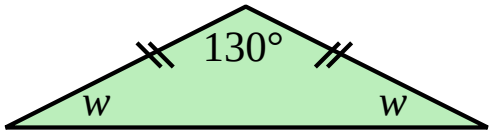
[1 mark]

(ii) The following septagon is not drawn accurately; it's just a sketch.
Use arithmetic to calculate the unknown angle, marked x



[3 marks]

Question 7
Find angle *w* in this isosceles triangle

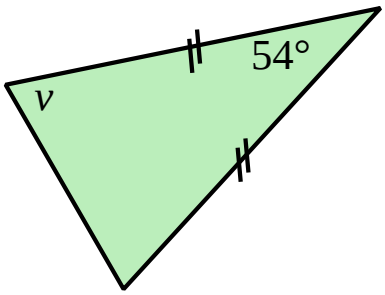


[2 marks]

Question 8
If a polygon the sum of the interior angles is 1440°
How many sides has the polygon ?

[1 mark]

Question 9
Find angle *v* in this isosceles triangle



[2 marks]

Question 10
What will the interior angles of a polygon with 22 sides sum to ?
Give a reason for your answer.

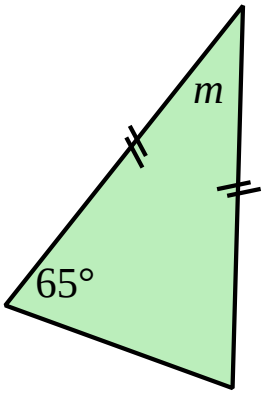
[2 marks]

Question 11
A polygon has interior angles that sum to 2160°
How many sides has the polygon ?
Give a reason for your answer.

[2 marks]

Question 12

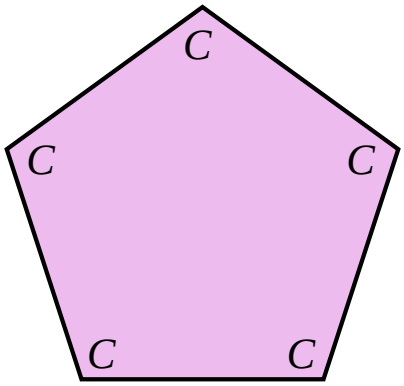
Find angle *m* in this isosceles triangle



[2 marks]

Question 13

A regular pentagon has five interior angles which are all the same size, and five sides which are all the same length.



Find angle *C*, the size of one interior angle, in a regular pentagon.

[3 marks]