

### Angles in triangles, on a line and around a point

#### Things to remember:

- Angles in a triangle sum to  $180^\circ$ .
- Angles on a line sum to  $180^\circ$ .
- Angles around a point sum to  $360^\circ$ .

#### Questions:

1. XYW is a straight line.  
Work out the size of the angle marked a.  
You must give reasons for your answer.

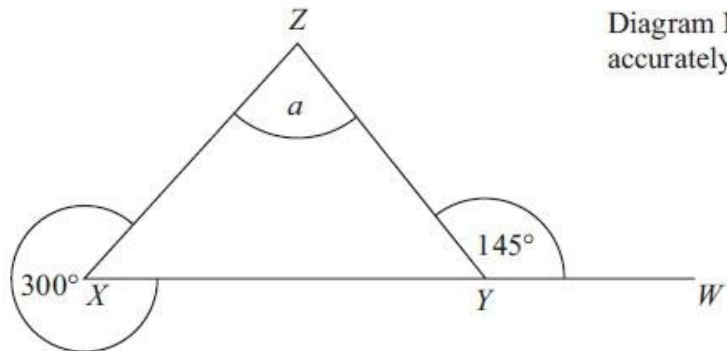
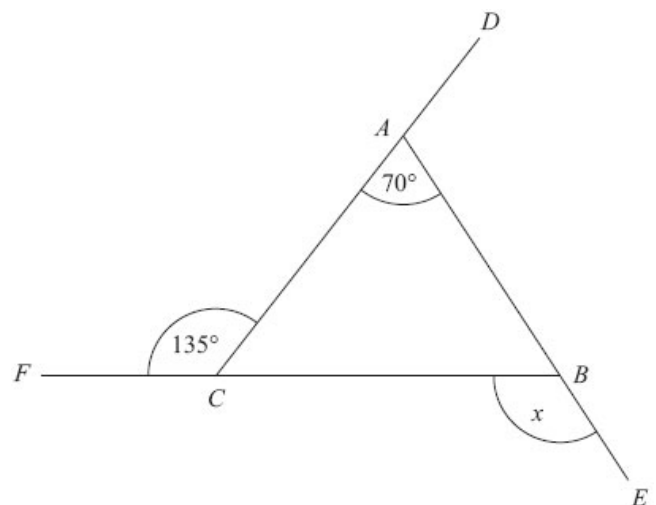


Diagram **NOT** accurately drawn

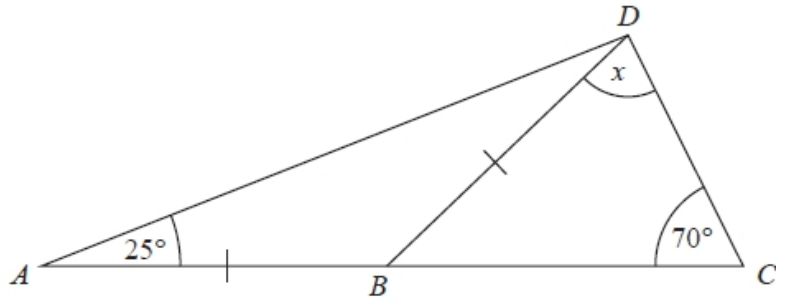
2. DAC, FCB and ABE are straight lines.  
Work out the size of the angle marked x.  
You must give reasons for your answer.



(Total for Question is 4 marks)

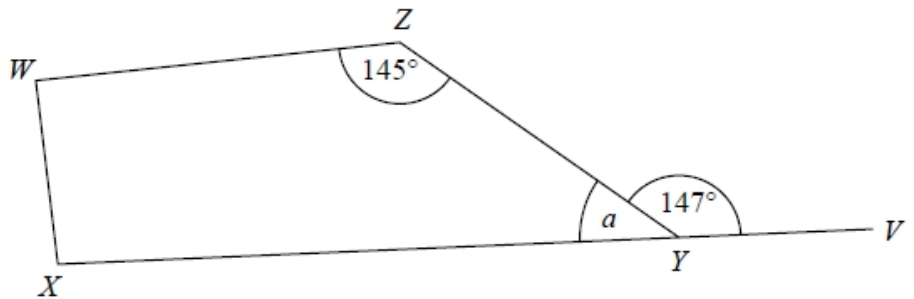
(Total for Question is 5 marks)

3. ABC is a straight line.  
 AB = BD  
 Angle BAD =  $25^\circ$   
 Angle BCD =  $70^\circ$   
 Work out the size of the angle marked x.  
 Give reasons for your answer.



(Total for Question is 4 marks)

4. WXYZ is a quadrilateral.  
 XYV is a straight line.  
 (a) (i) Find the size of the angle marked a.



.....

.....<sup>o</sup>

- (ii) Give a reason for your answer.

.....

(2)

Angle ZWX = angle WXY

- (b) Work out the size of angle ZWX.

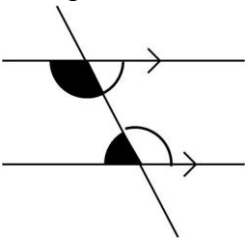
.....<sup>o</sup>

(2)

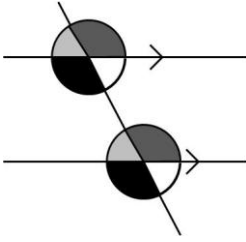
(Total for question = 4 marks)

**Angles in parallel lines**

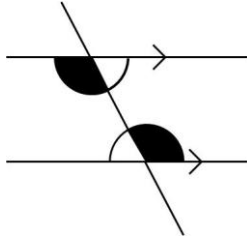
Things to remember:



C-shape co-interior angles add up to 180°



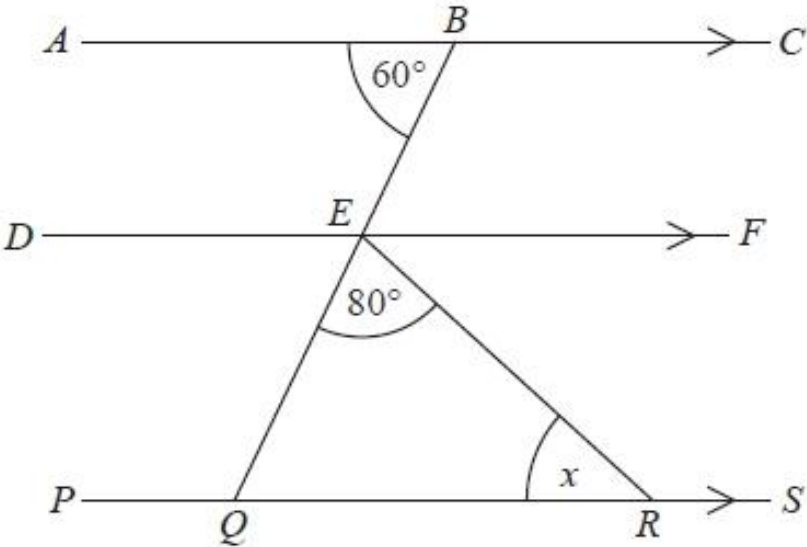
F-shaped corresponding angles are equal



Z-shaped alternate angles are equal

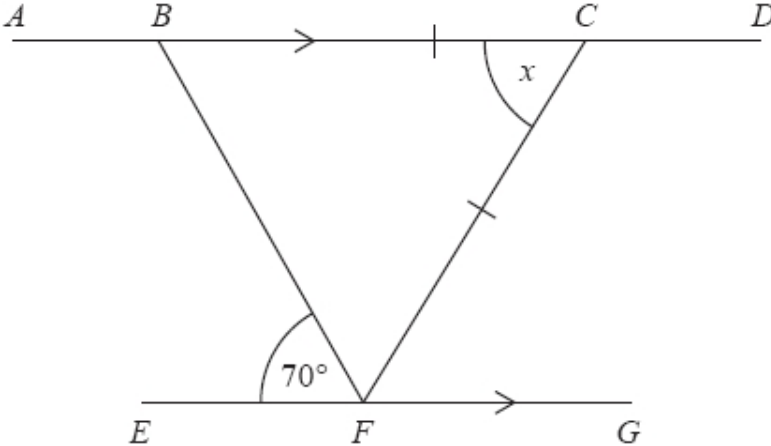
**Questions:**

- 1. Diagram not drawn accurately. *ABC*, *DEF* and *PQRS* are parallel lines. *BEQ* is a straight line. Angle *ABE* = 60° Angle *QER* = 80° Work out the size of the angle marked *x*. Give reasons for each stage of your working.



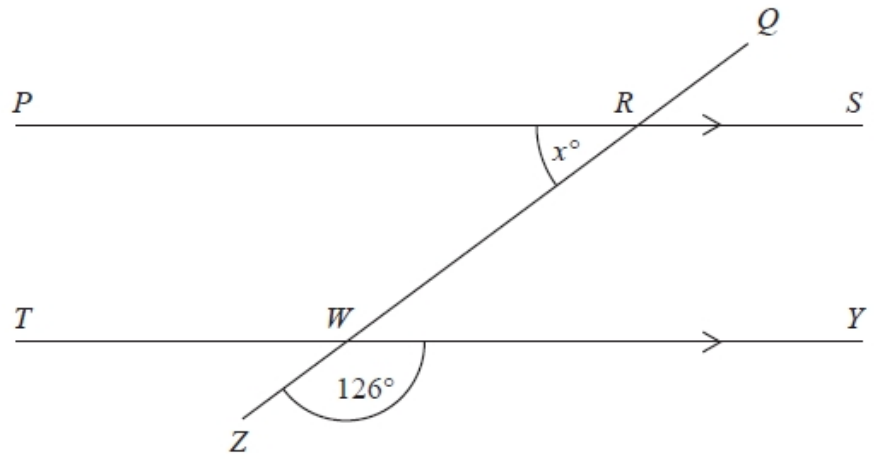
(Total for question = 4 marks)

- 2. Diagram not drawn accurately. *ABCD* and *EFG* are parallel lines. *BC* = *CF* Angle *BFE* = 70° Work out the size of the angle marked *x*. Give reasons for each stage of your working.



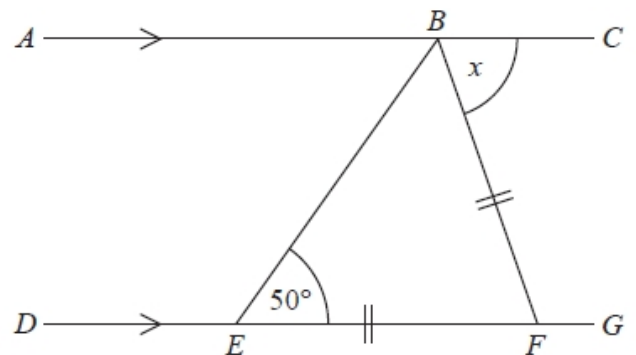
(Total for question = 4 marks)

3. Diagram NOT accurately drawn  
 PRS and TWY are parallel straight lines.  
 QRWZ is a straight line.  
 Work out the value of  $x$ .  
 Give reasons for your answer.



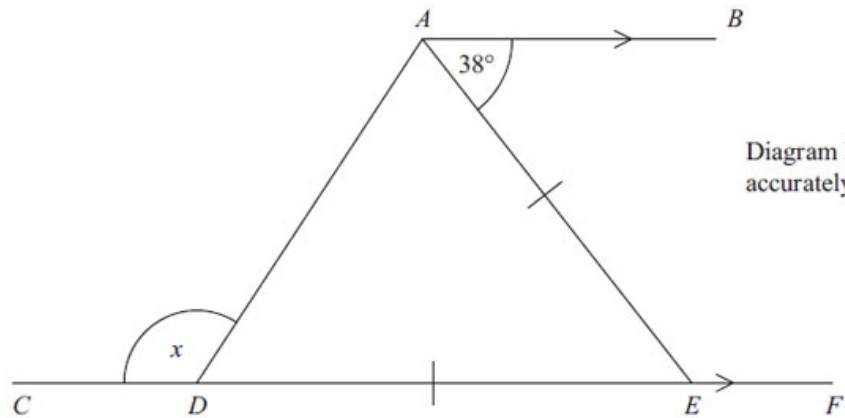
(Total for question = 3 marks)

4. ABC is a straight line.  
 DEFG is a straight line.  
 AC is parallel to DG.  
 EF = BF.  
 Angle BEF =  $50^\circ$ .  
 Work out the size of the angle marked  $x$ .  
 Give reasons for your answer.

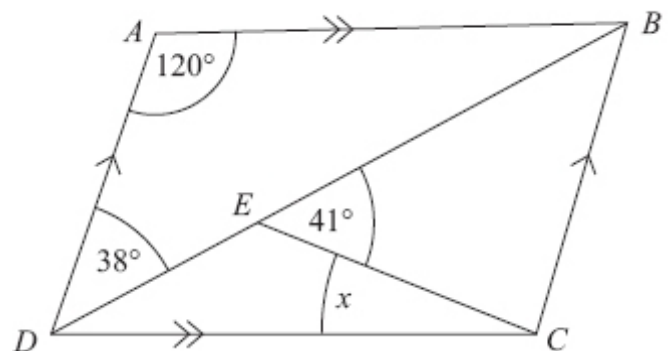


.....  
 (Total for Question is 4 marks)

5. CDEF is a straight line.  
 AB is parallel to CF.  
 DE = AE.  
 Work out the size of the angle marked  $x$ .  
 You must give reasons for your answer.



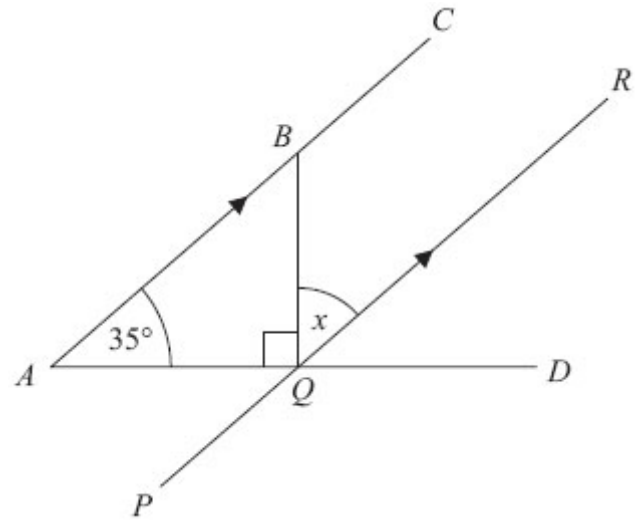
6. ABCD is a parallelogram.  
 Angle ADB =  $38^\circ$ .  
 Angle BEC =  $41^\circ$ .  
 Angle DAB =  $120^\circ$ .  
 Calculate the size of angle  $x$ .  
 You must give reasons for your answer.



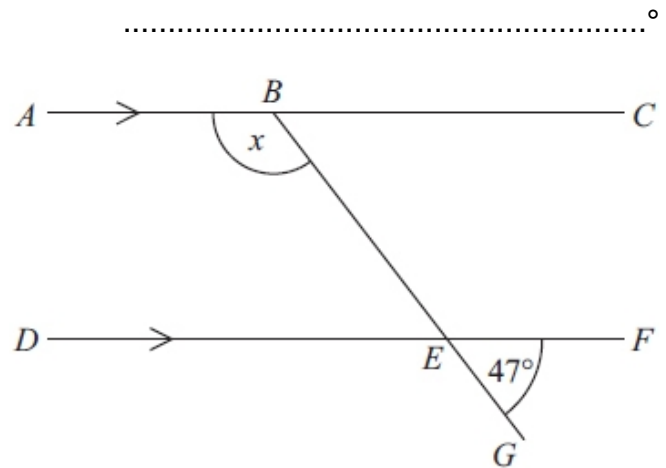
(Total for Question is 4 marks)

(Total for Question is 4 marks)

7. ABC, PQR and AQD are straight lines.  
 ABC is parallel to PQR.  
 Angle BAQ =  $35^\circ$   
 Angle BQA =  $90^\circ$   
 Work out the size of the angle marked x.  
 Give reasons for each stage of your working.



8. **(Total for Question is 4 marks)**  
 Diagram NOT accurately drawn  
 ABC and DEF are parallel lines.  
 BEG is a straight line.  
 Angle GEF =  $47^\circ$ .  
 Work out the size of the angle marked x.  
 Give reasons for your answer.



.....<sup>o</sup>  
**(Total for Question is 3 marks)**

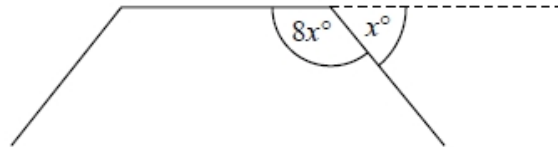
## Interior and exterior angles

### Things to remember:

- Interior Angles:
  - For  $n$  sides, the sum of interior angles =  $(n - 2) \times 180$
  - Each interior angle =  $\frac{(n - 2) \times 180}{n}$
- Exterior Angles:
  - The sum of exterior angles in any shape (or polygon) is  $360^\circ$

### Questions:

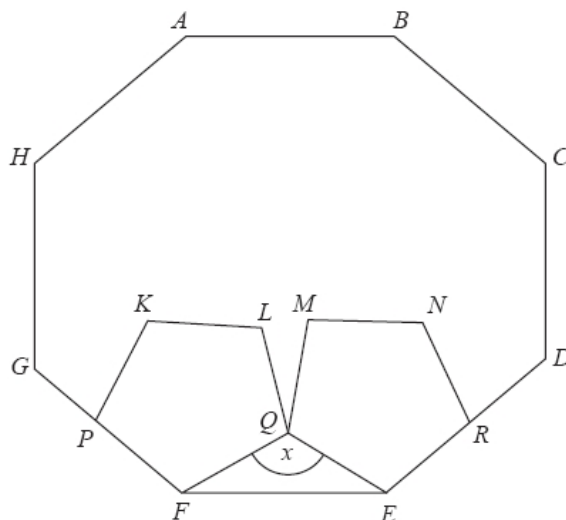
1. The diagram shows three sides of a regular polygon.  
The size of each exterior angle of the regular polygon is  $x^\circ$ .  
The size of each interior angle of the regular polygon is  $8x^\circ$ .  
Work out the number of sides the regular polygon has.



.....  
(Total for question = 3 marks)

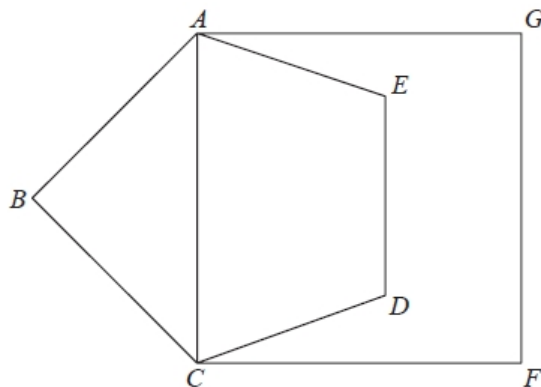
2. ABCDEFGH is a regular octagon.  
KLQFP and MNREQ are two identical regular pentagons.

Work out the size of the angle marked  $x$ .  
You must show all your working.

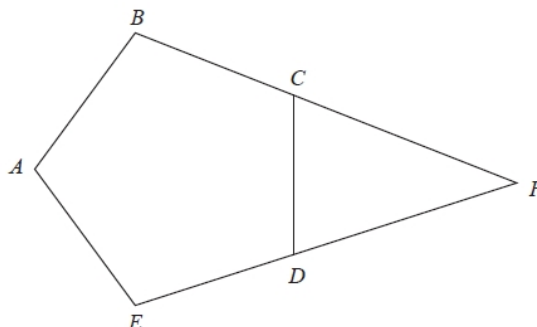


.....  
(Total for question = 4 marks)

3. Diagram not drawn accurately.  
 ABCDE is a regular pentagon.  
 ACFG is a square.  
 Work out the size of angle DCF.  
 You must show all your working.



4. ABCDE is a regular pentagon.  
 BCF and EDF are straight lines.  
 Work out the size of angle CFD.  
 You must show how you got your answer.

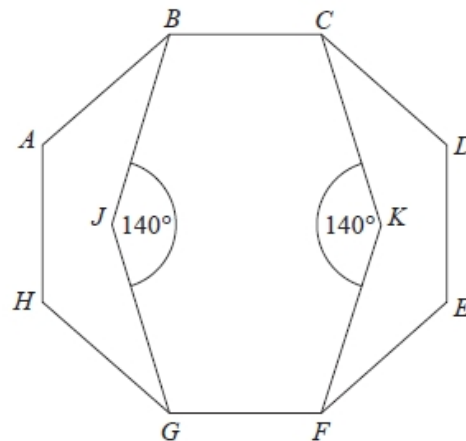


.....°  
**(Total for question = 4 marks)**

.....°  
**(Total for question = 3 marks)**

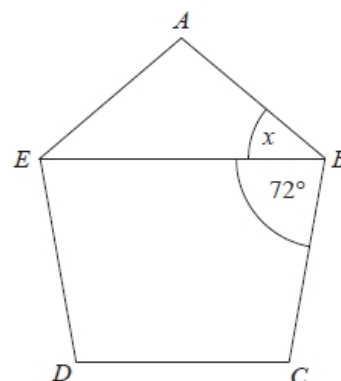


5. Diagram not drawn accurately.  
 ABCDEFGH is a regular octagon.  
 BCKFGJ is a hexagon.  
 JK is a line of symmetry of the hexagon.  
 Angle BJK = angle CKF =  $140^\circ$   
 Work out the size of angle KFE.  
 You must show all your working.



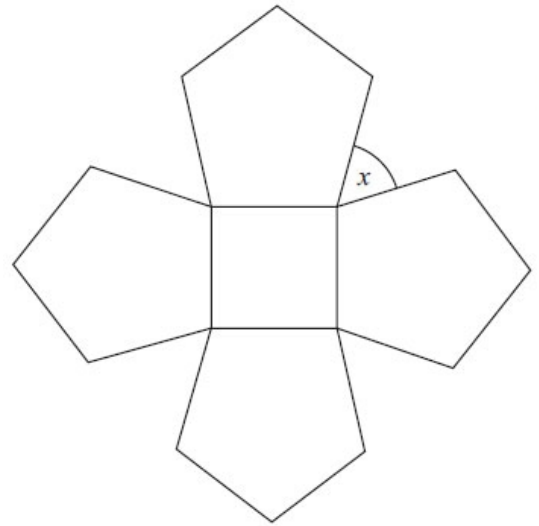
..... °  
**(Total for Question is 4 marks)**

6. Diagram not drawn accurately .  
 ABCDE is a regular polygon.  
 EB is a straight line.  
 Angle EBC =  $72^\circ$ .  
 Work out the size of the angle marked x.



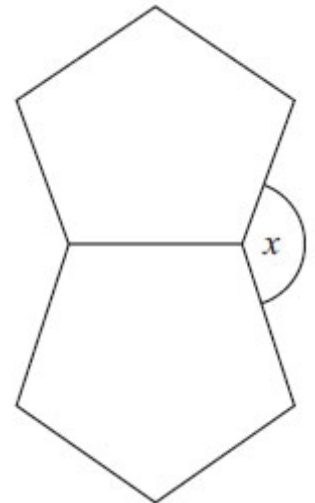
..... °  
**(Total for question = 3 marks)**

7. The diagram shows a square and 4 regular pentagons.  
Work out the size of the angle marked  $x$ .



.....  
(Total for question = 3 marks)

8. The diagram shows two regular shapes.  
Work out the size of the angle marked  $x$ .



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

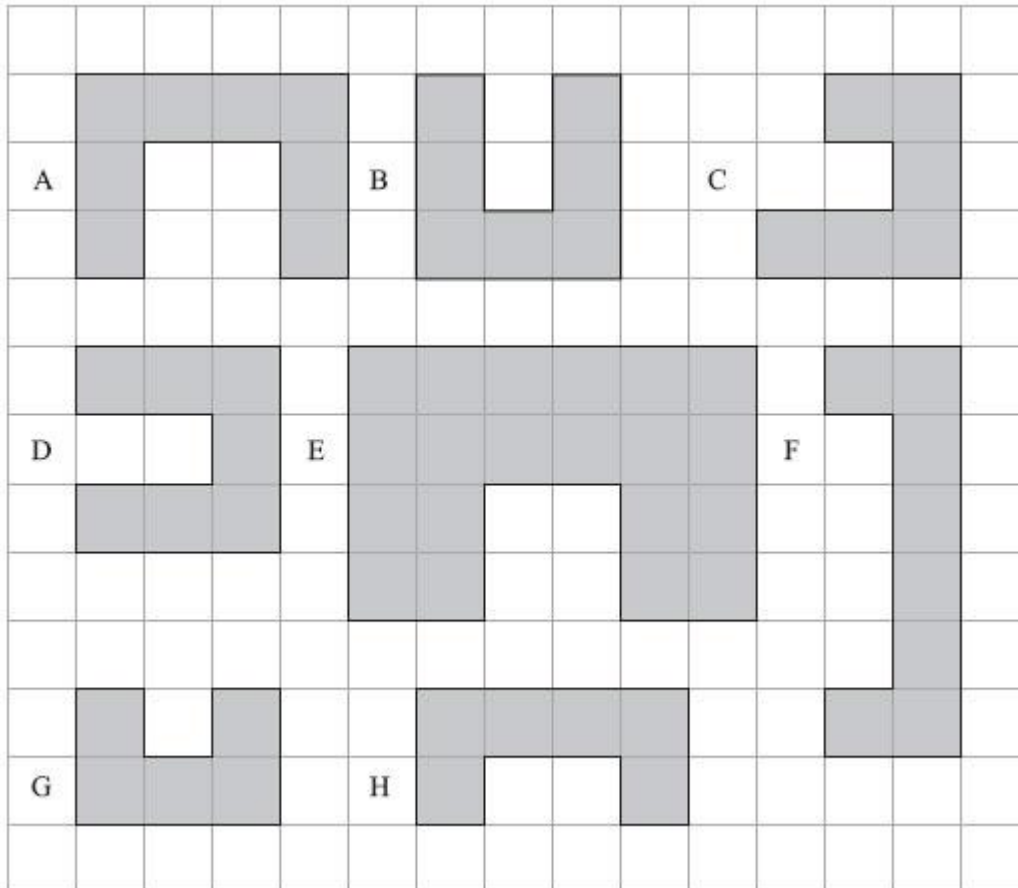
## Proofs of congruence and similarity

### Things to remember:

- To prove congruence, look for:
  - Side, angle, side
  - Angle, side, angle
  - Side, side, side, or
  - Right-angle, hypotenuse, (other) side

### Questions:

1. These shapes have been drawn on a grid of centimetre squares.



(a) (i) Write down the letters of a pair of shapes that are congruent.

.....  
 (ii) Write down the letters of a different pair of shapes that are similar.

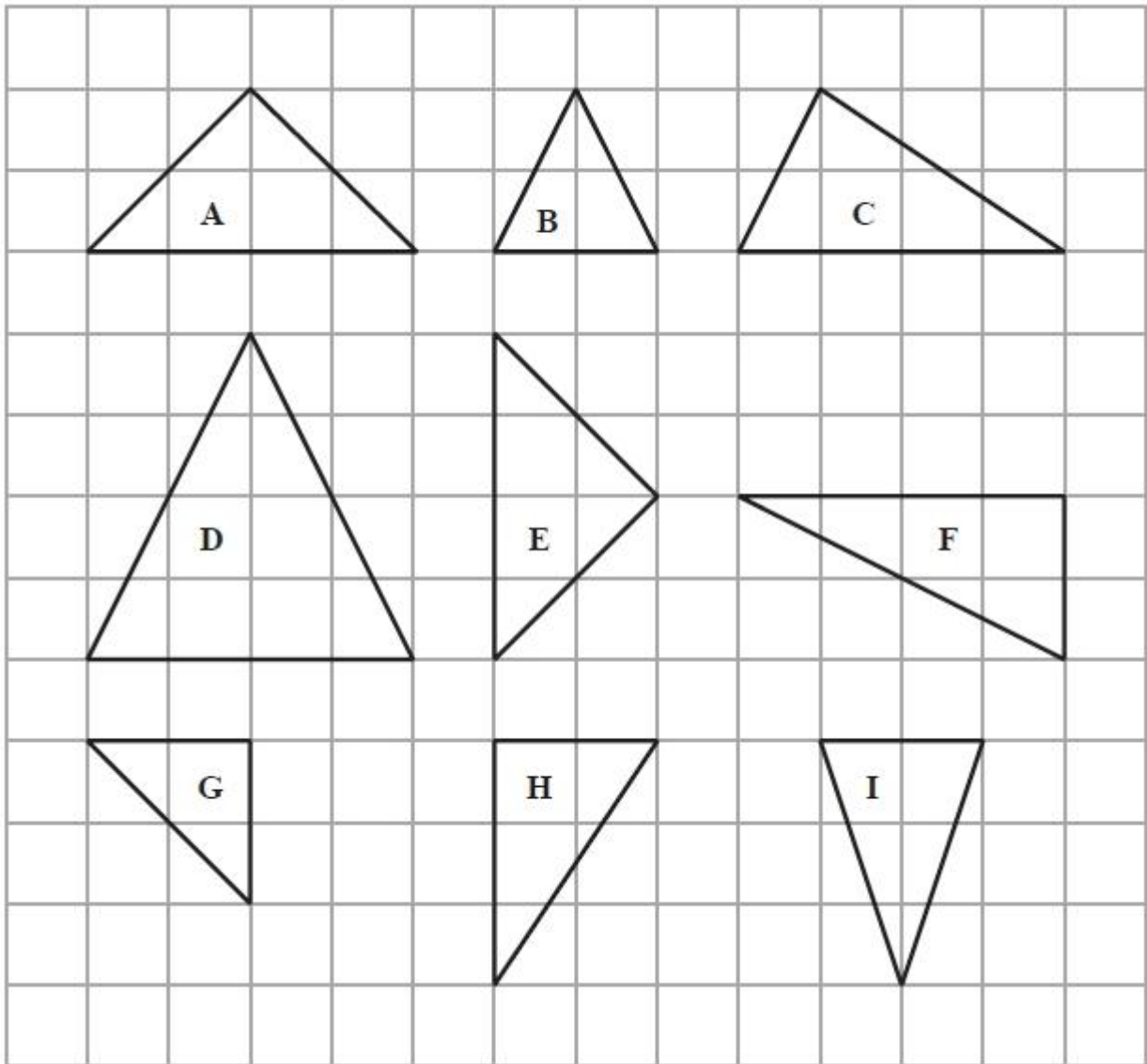
..... (2)

(b) Find the perimeter of shape D.

..... (1)

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

2. Here are some triangles drawn on a grid.



Two of these triangles are congruent.

(a) Write down the letters of these triangles.

..... and .....  
(1)

One of the triangles is similar to triangle **B**.

(b) Write down the letter of this triangle.

.....  
(1)

(Total for Question is 2 marks)