11. (i) (a) Calculate the size of an exterior angle of a
regular octagon.
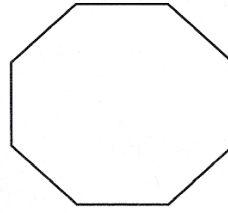
not to
scale

°

Answer: .... (2)

(b) Calculate the size of an interior angle of a regular octagon.

°

Answer: .... (1)

12.
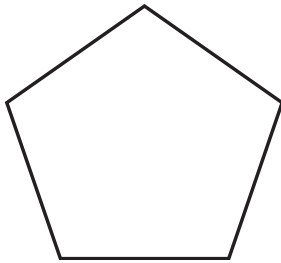

Diagram **NOT**
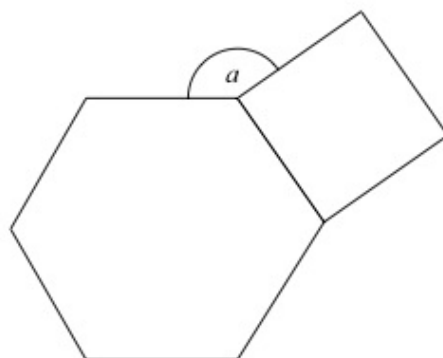accurately drawn

Work out the size of an exterior angle of a regular pentagon.

3.

Diagram **NOT** accurately drawn

The diagram shows a regular hexagon and a square.

Calculate the size of the angle *a*.

.....................................°
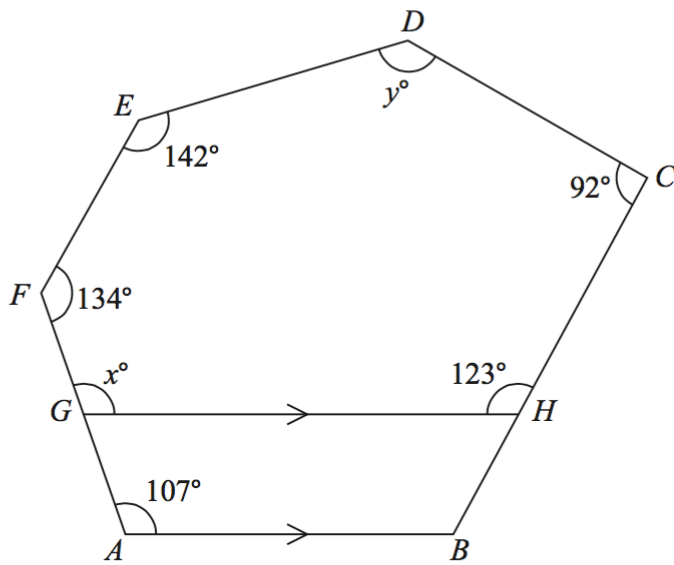
(Total 4 marks)

4

Diagram **NOT**
accurately drawn

ABCDEF is a hexagon.
G is a point on *AF*.
H is a point on *BC*.
GH is parallel to *AB*.

(a) Give a reason why $x = 107$

....

(1)

(b) Work out the value of y.

18 The diagram shows part of a pattern made from tiles.

Tile A

Tile B

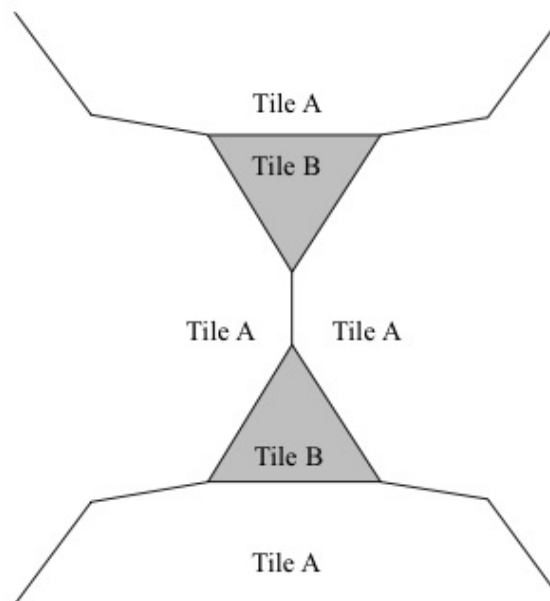Tile A   Tile A

Tile B

Tile A

Diagram **NOT** accurately drawn

The pattern is made from two types of tiles, tile A and tile B.

Both tile A and tile B are regular polygons.

Work out the number of sides tile A has.

....

(Total for Question 18 is 4 marks)

....
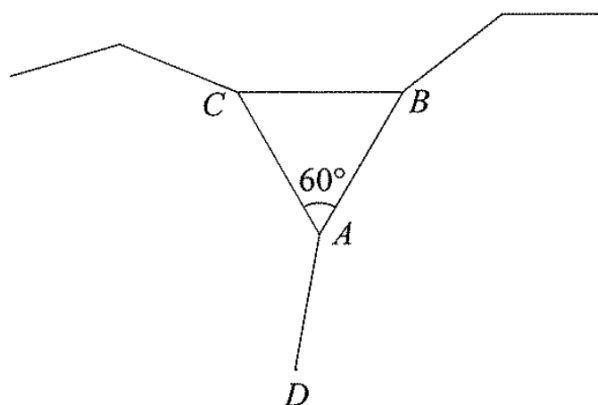
(2)

(Total 7 marks)

15.

Diagram **NOT**
accurately drawn

The sides of an equilateral triangle ABC and two **regular** polygons meet at the point A.
AB and AD are adjacent sides of a regular 10-sided polygon.
AC and AD are adjacent sides of a regular n-sided polygon.
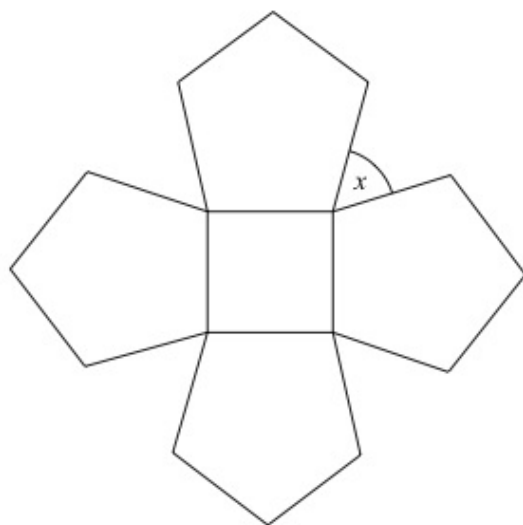
Work out the value of n.

13

Diagram **NOT**
accurately drawn

The diagram shows a square and 4 regular pentagons.

Work out the size of the angle marked x.

.... °
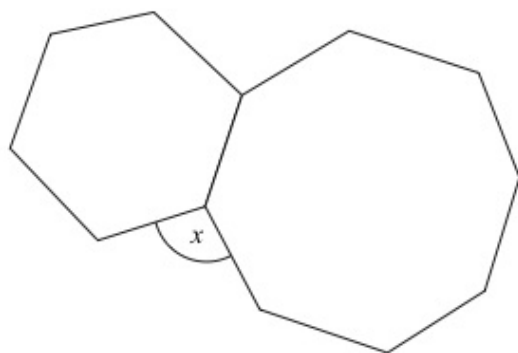
(Total for Question 13 is 3 marks)

13

Diagram **NOT**
accurately drawn

The diagram shows a regular hexagon and a regular octagon.

Calculate the size of the angle marked x.
You must show all your working.

.... °

(Total for Question 13 is 4 marks)

16
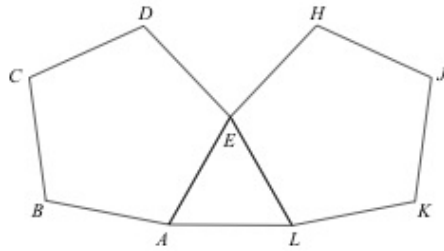
D · · · · · · H

C

E

B · · · · · · K

A · · · · · · L

J

Diagram **NOT**
accurately drawn

ABCDE and *EHJKL* are regular pentagons.
AEL is an equilateral triangle.

Work out the size of angle *DEH*.

· °

15.
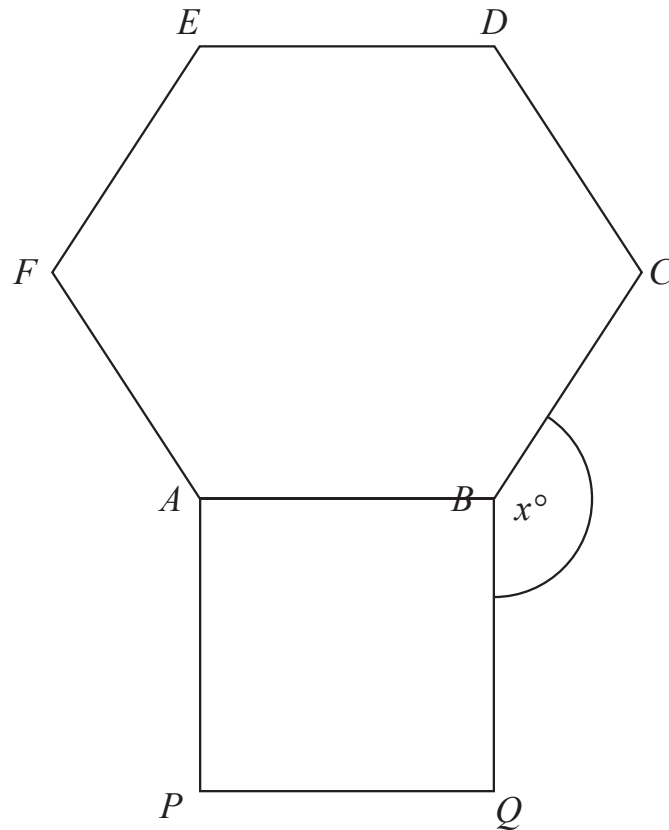
ABCDEF is a regular hexagon and *ABQP* is a square.
Angle *CBQ* = $x°$.
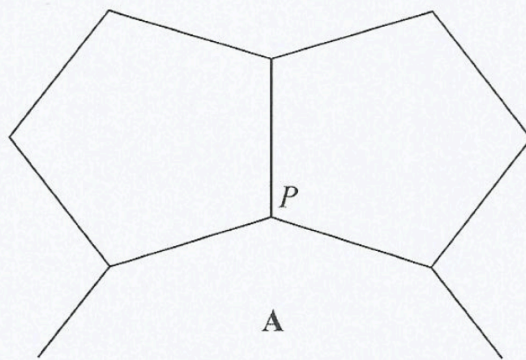
Work out the value of *x*.

13

Diagram **NOT** accurately drawn

The diagram shows two congruent regular pentagons and part of a regular *n*-sided polygon **A**.

Two sides of each of the regular pentagons and two sides of **A** meet at the point *P*.

Calculate the value of *n*.

Show your working clearly.
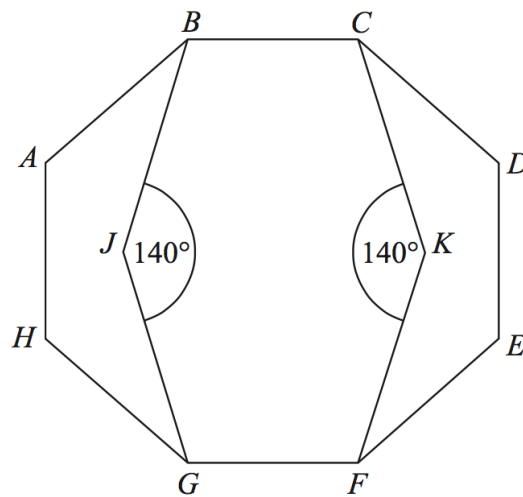
17

Diagram **NOT** accurately drawn

ABCDEFGH is a regular octagon.
BCKFGJ is a hexagon.

JK is a line of symmetry of the hexagon.
Angle *BJG* = angle *CKF* = 140°

Work out the size of angle *KFE*.
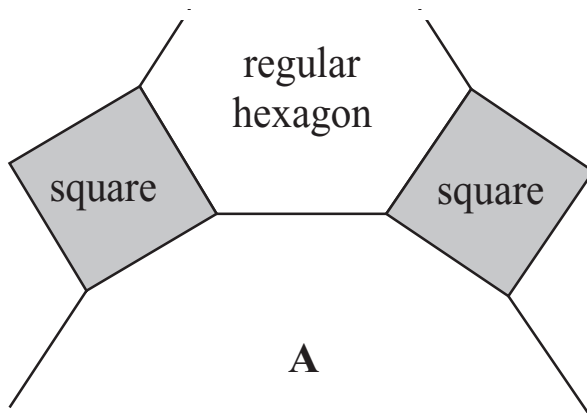You must show all your working.

13.

Diagram **NOT** accurately drawn

The diagram shows part of a tiling pattern.
The tiling pattern is made from three shapes.
Two of the shapes are squares and regular hexagons.
The third shape is a regular *n*-sided polygon **A**.

Work out the value of *n*.

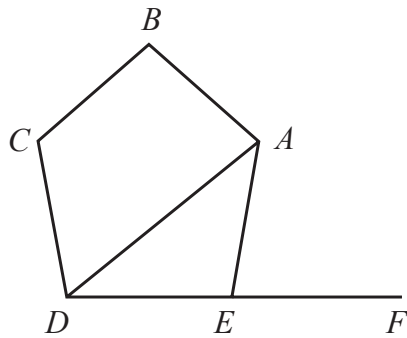**13.** The size of each exterior angle of a regular polygon is 18°.

(a) Work out how many sides the polygon has.

....
(2)

(b) Work out the **sum** of the interior angles of the polygon.

°
....
(2)

17

NOT TO SCALE

ABCDE is a regular pentagon.
DEF is a straight line.
Calculate

(a) angle *AEF*,

Answer(a) Angle *AEF* = ... [2]

(b) angle *DAE*.

Answer(b) Angle *DAE* = ... [1]

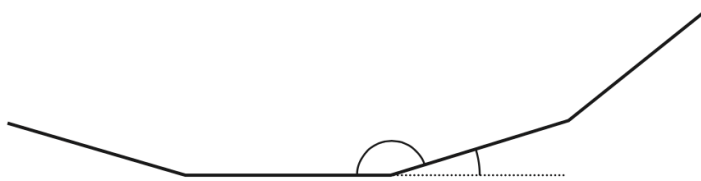**13** The diagram shows an incomplete regular polygon.

Diagram **NOT**
accurately drawn

The size of each interior angle is 140 degrees greater than the size of each exterior angle.

Work out the number of sides the regular polygon has.

19

The diagram shows part of a regular polygon.
The interior angle and the exterior angle at a vertex are marked.
The size of the interior angle is 7 times the size of the exterior angle.

Work out the number of sides of the polygon.

....

(Total for Question 19 is 3 marks)

9 (a) Find the sum of the interior angles of a polygon with 7 sides.

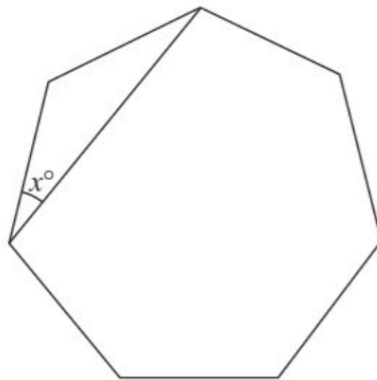.. $^{\circ}$

(2)

Diagram **NOT** accurately drawn

The diagram shows a regular polygon with 7 sides.

(b) Work out the value of x.
Give your answer correct to 1 decimal place.

Turn ove

Leave
blank

3. (a) The diagram shows a regular octagon, with centre O.

Diagram **NOT**
accurately drawn

O

$x°$
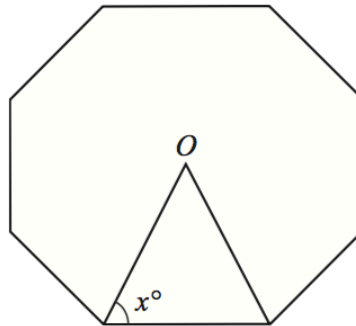
Work out the value of x.

$x =$ ....

(3)
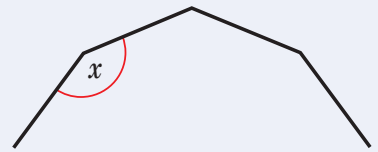
(b) A regular polygon has an exterior angle of 30°.
Work out the number of sides of the polygon.

13. The size of each interior angle of a regular polygon is 11 times the size of each exterior angle.

Work out the number of sides the polygon has.

15 The diagram shows part of a regular 10-sided polygon.
Work out the size of the angle marked x.

1   John divides a regular polygon into 16 triangles by drawing all the diagonals from one vertex.
   **a** How many diagonals does John draw?
    b How many sides has the polygon?
    c What is the size of each of the interior angles of the polygon?
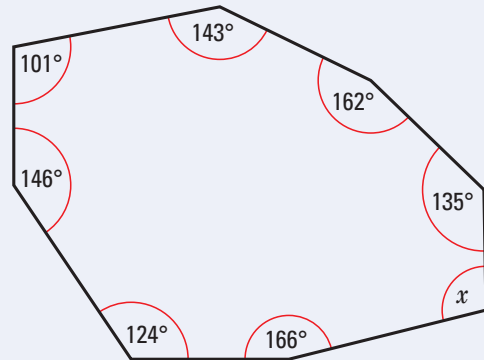
2   Work out the size of each interior angle of:
    a a regular hexagon
    b a regular decagon
    c a regular polygon with 30 sides.

3   Work out the size of each of the marked angles in these polygons. You must show your working.
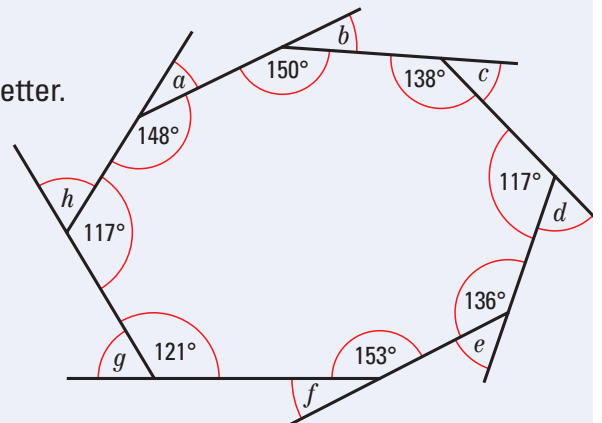
    a

    131°
    65°
    112°
    y

    b

    143°
    101°
    162°
    146°
    135°
    124°   166°
    x
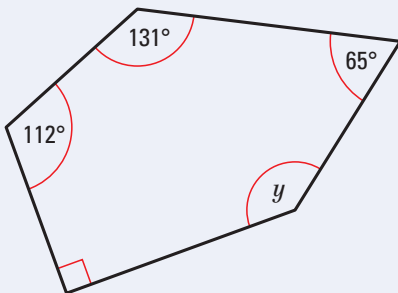
4   Explain why the size of the angle at the centre of a regular polygon cannot be 25°.

5   Here is an octagon.
    a Work out the size of each of the angles marked with a letter.
    b Work out the value of $a + b + c + d + e + f + g + h$

    b
    150°   138° c
    a
    148°
    117°
    h
    d
    117°
    136°
    g 121°   153° e
    f

1   One vertex of a polygon is the point P.
    a   Work out the size of the interior angle at P when the exterior angle at P is: i 70°   ii 37°.
    b   Work out the size of the exterior angle at P when the interior angle at P is: i 130° ii 144°.

2   Work out the size of each exterior angle of:
    a   a regular pentagon   b   a regular octagon
    c   a regular polygon with 12 sides   d   a regular 25-sided polygon.

3   The size of each exterior angle of a regular polygon is 15°.
    a   Work out the number of sides the polygon has.
    b   What is the sum of the interior angles of the polygon?

4   The sizes of five of the exterior angles of a hexagon are 36°, 82°, 51°, 52° and 73°.
    Work out the size of each of the interior angles of the hexagon.

5   A, B and C are three vertices of a regular polygon with 30 sides.
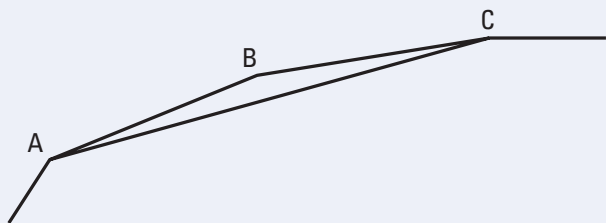
    Work out the size of angle BCA.
    Give reasons for your working.

* 6   The diagram shows three sides, AB, BC and CD, of a regular polygon with centre O.
    The angle at the centre of the polygon is c.
    The exterior angle of the polygon at the vertex C is e.

    Explain why $c = e$.