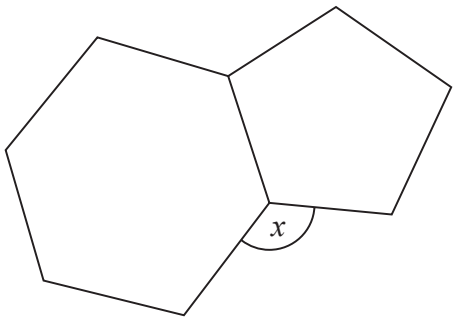
1 Here is a regular hexagon and a regular pentagon.



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

.....°

(Total for Question 1 is 3 marks)

2

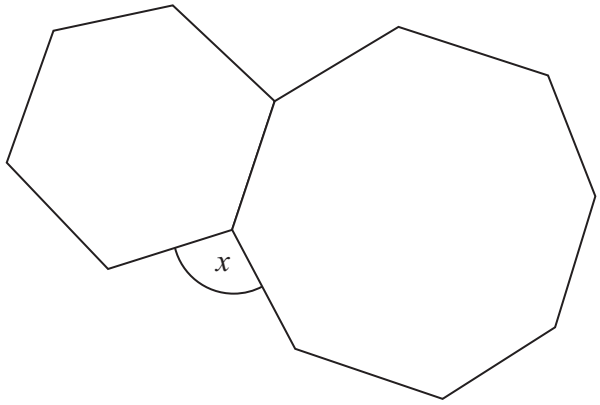


Diagram **NOT** accurately drawn

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 2 is 4 marks)

3

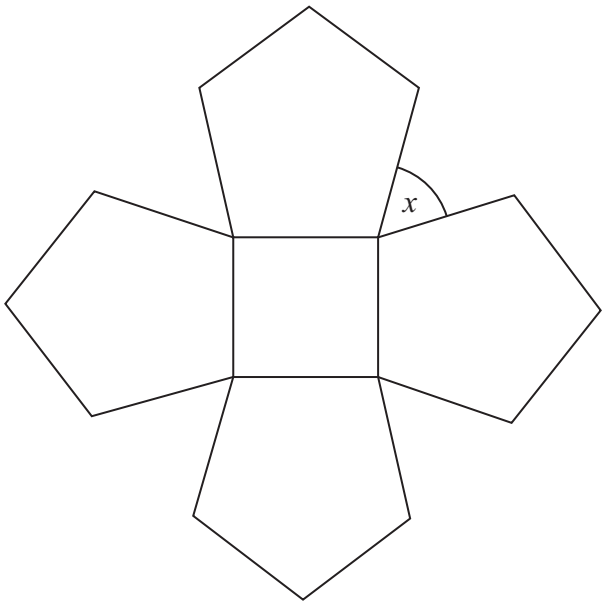


Diagram **NOT** accurately drawn

The diagram shows a square and 4 regular pentagons.

Work out the size of the angle marked x.

.....°

(Total for Question 3 is 3 marks)

4

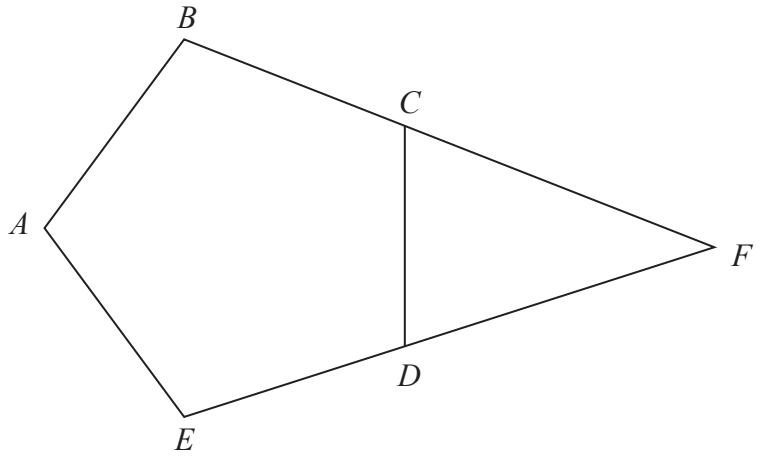


Diagram **NOT** accurately drawn

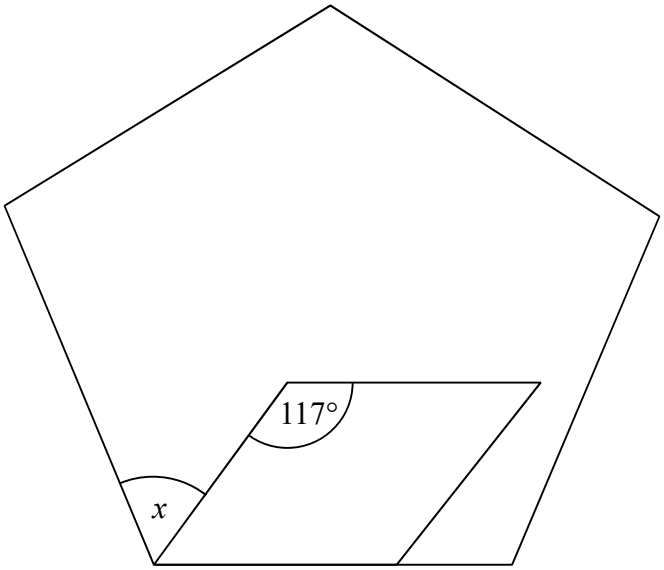
ABCDE is a regular pentagon.
BCF and *EDF* are straight lines.

Work out the size of angle *CFD*.
You must show how you got your answer.

.....°

(Total for Question 4 is 3 marks)

5 The diagram shows a regular pentagon and a parallelogram.



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

.....°

(Total for Question 5 is 4 marks)

6 The diagram shows a pattern using four identical rhombuses.

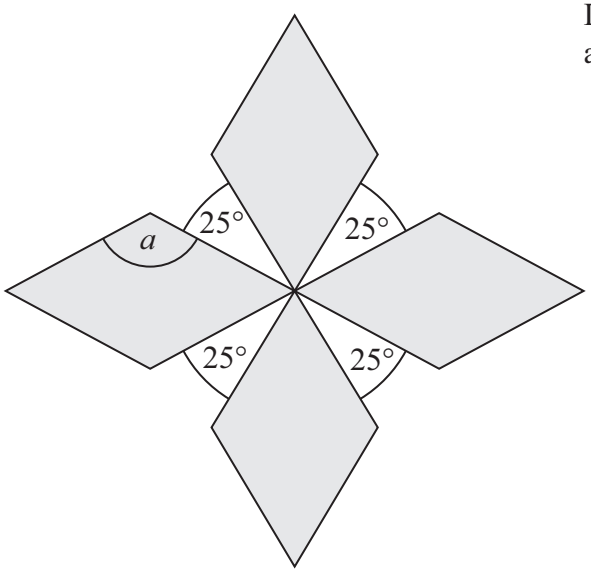


Diagram **NOT** accurately drawn

Work out the size of the angle marked *a*.
You must show your working.

.....°

(Total for Question 6 is 4 marks)

7

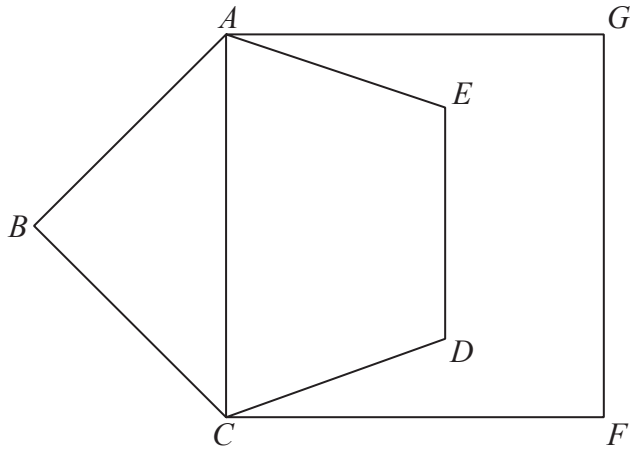


Diagram **NOT** accurately drawn

ABCDE is a regular pentagon.
ACFG is a square.

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

.....°

(Total for Question 7 is 4 marks)

8

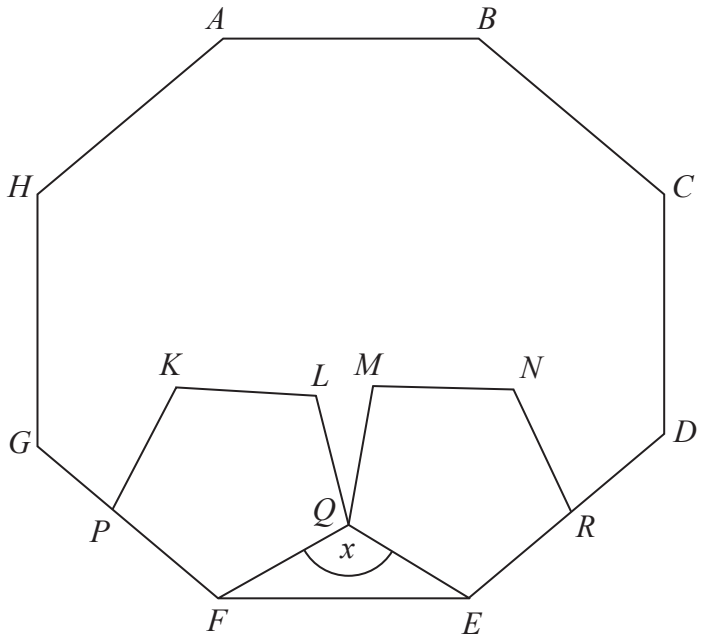


Diagram **NOT** accurately drawn

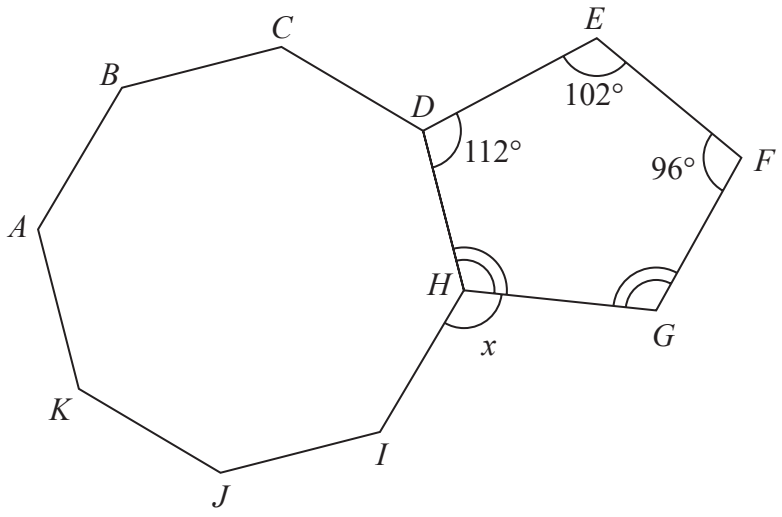
ABCDEFGH is a regular octagon.
KLQFP and *MNREQ* are two identical regular pentagons.

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

.....°

(Total for Question 8 is 4 marks)

9 The diagram shows a regular octagon *ABCDHIJK* and a pentagon *DEFGH*.



Angle *GHD* = angle *FGH*.

Work out the size of the angle marked *x*.
Show your working clearly.

.....°

(Total for Question 9 is 5 marks)

10

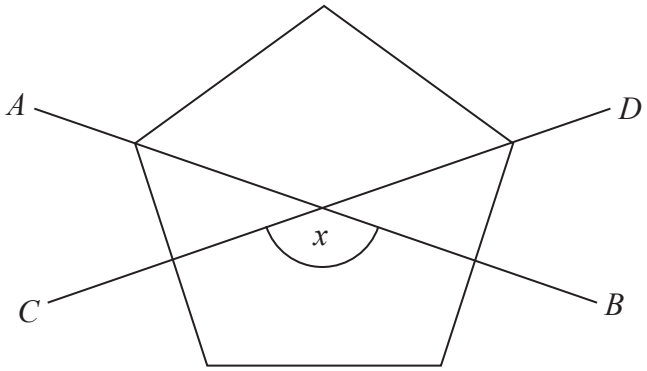


Diagram **NOT** accurately drawn

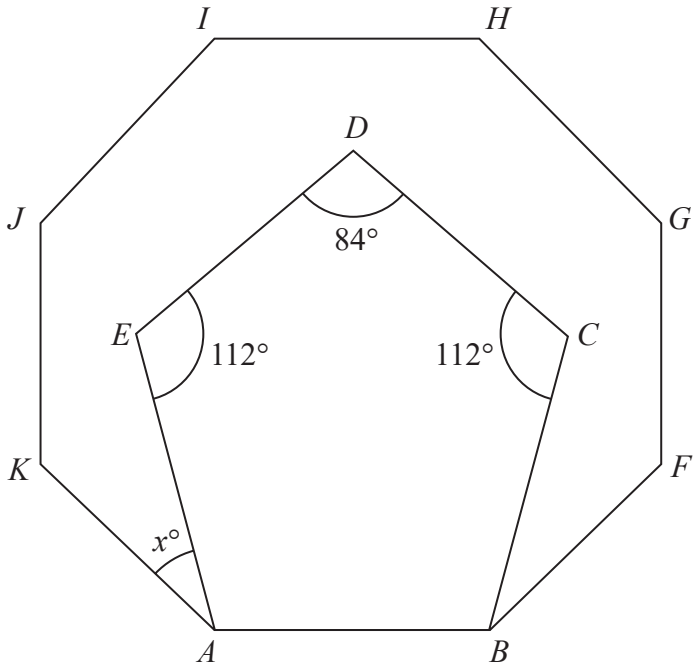
The diagram shows a regular pentagon.
AB and *CD* are two of the lines of symmetry of the pentagon.

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

.....°

(Total for Question 10 is 4 marks)

11



Pentagon *ABCDE* is drawn inside the regular octagon *ABFGHIJK*.
The pentagon has exactly one line of symmetry.

Work out the value of x.

$x =$

(Total for Question 11 is 4 marks)

12

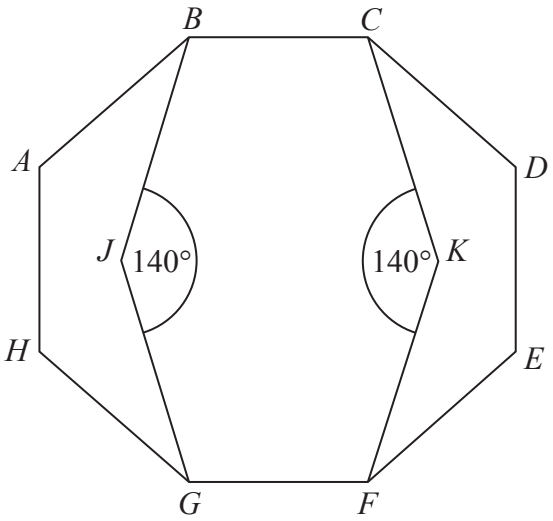


Diagram **NOT** accurately drawn

ABCDEFGH is a regular octagon.
BCKFGJ is a hexagon.

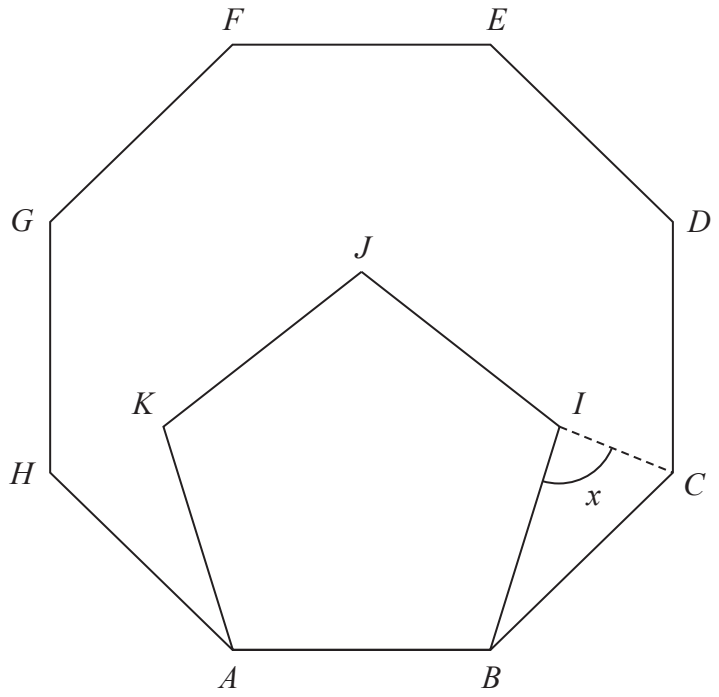
JK is a line of symmetry of the hexagon.
Angle *BJG* = angle *CKF* = 140°

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

.....°

(Total for Question 12 is 4 marks)

13 The diagram shows a regular octagon *ABCDEFGH* and a regular pentagon *ABIJK*

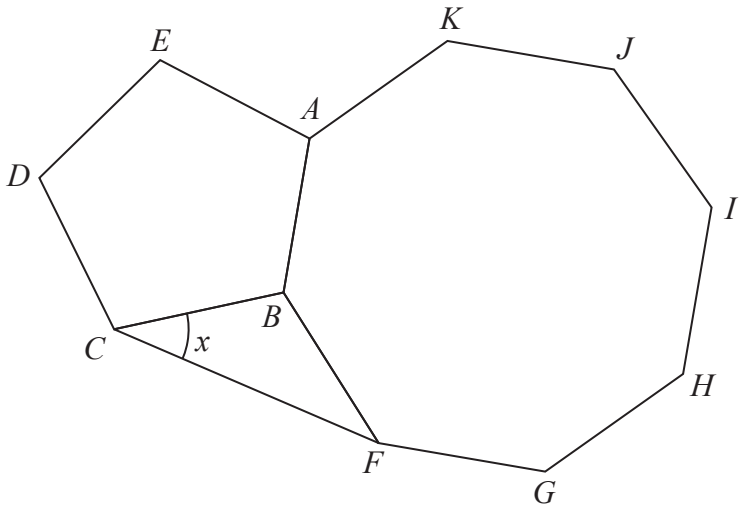


Work out the size of the angle x

.....°

(Total for Question 13 is 4 marks)

14



The diagram shows a regular pentagon, *ABCDE*, a regular octagon, *ABFGHIJK*, and an isosceles triangle, *BCF*.

Work out the size of angle *x*.

.....°

(Total for Question 14 is 4 marks)

15 The diagram shows a regular pentagon, *ABCDE*, a regular hexagon, *CFGHID*, and a quadrilateral, *EDIJ*.

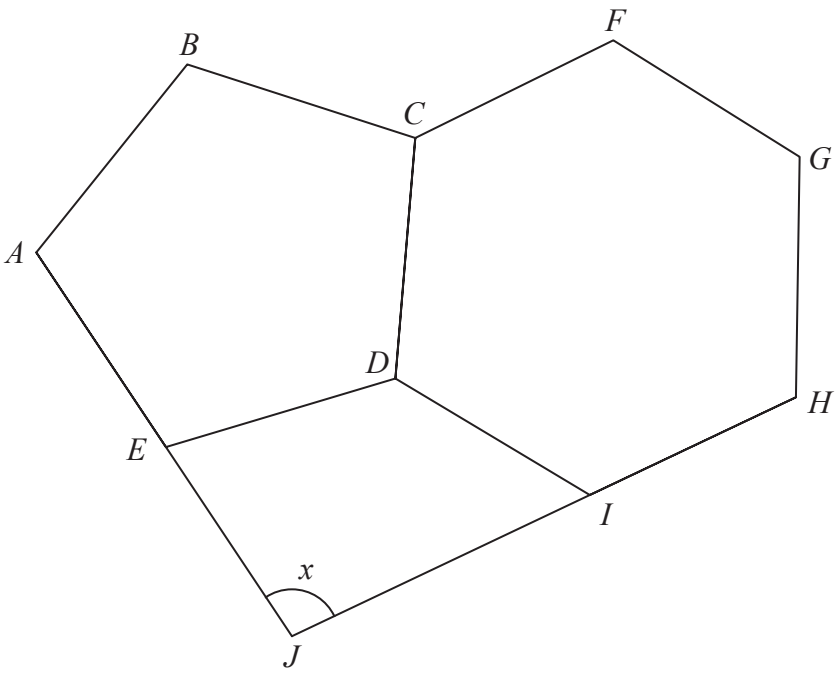


Diagram **NOT** accurately drawn

AEJ and *HIJ* are straight lines.

Work out the size of the angle marked *x*.
Show your working clearly.

.....°

(Total for Question 15 is 5 marks)

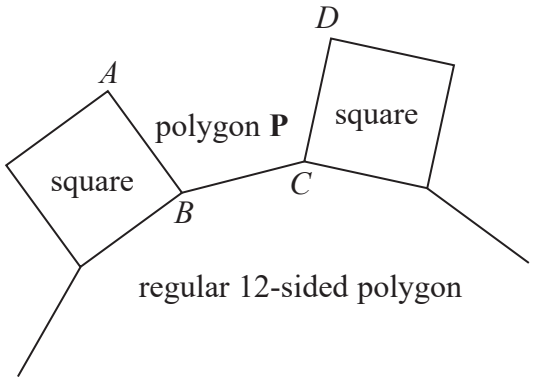
16 Each interior angle of a regular polygon is 162°

Work out the number of sides the polygon has.

.....

(Total for Question 9 is 3 marks)

17 In the diagram, *AB*, *BC* and *CD* are three sides of a regular polygon **P**.



Show that polygon **P** is a hexagon.
You must show your working.

(Total for Question 17 is 4 marks)

18 The diagram shows parts of three regular polygons, **A**, **B** and **C**, meeting at a point.

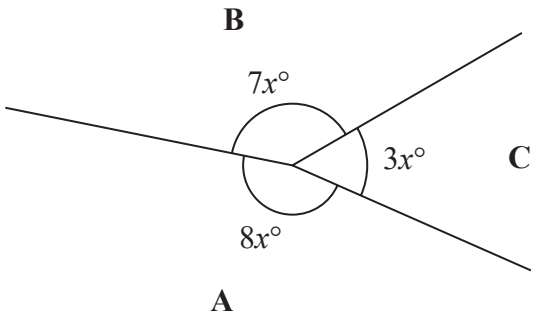


Diagram **NOT** accurately drawn

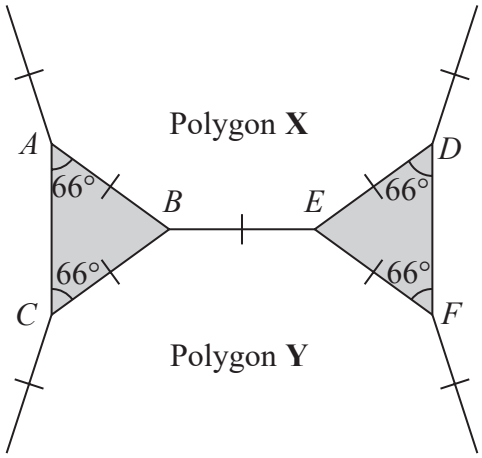
Polygon **B** has n sides.

Work out the value of n.

$n =$ .....

(Total for Question 18 is 4 marks)

19 The diagram shows two congruent isosceles triangles and parts of two congruent regular polygons, **X** and **Y**.



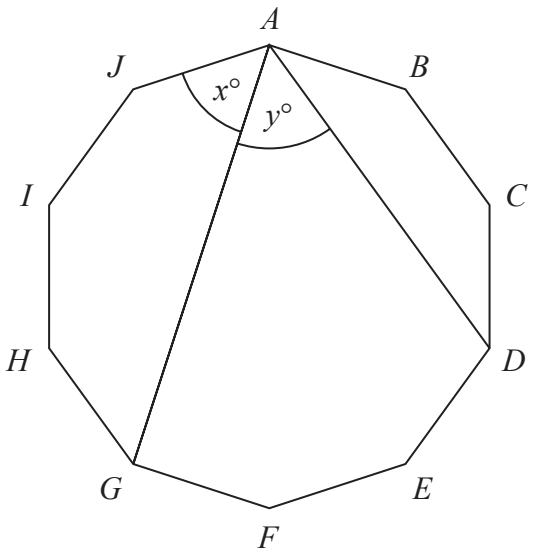
The two regular polygons each have n sides.

Work out the value of n.

$n =$ .....

(Total for Question 19 is 3 marks)

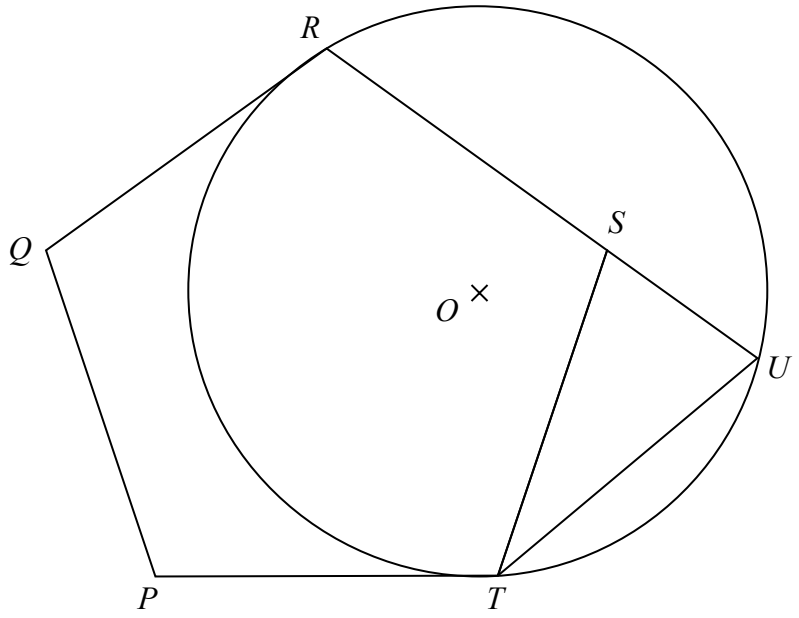
20 The diagram shows a regular 10-sided polygon, *ABCDEFGHIJ*



Show that $x = y$

(Total for Question 20 is 4 marks)

21

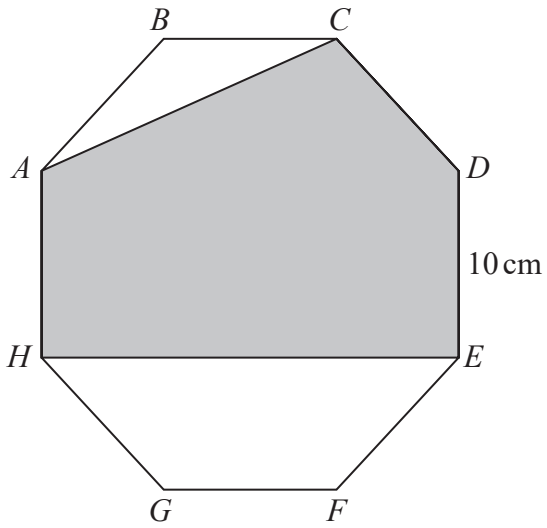


PQRST is a regular pentagon.
R, *U* and *T* are points on a circle, centre *O*.
QR and *PT* are tangents to the circle.
RSU is a straight line.

Prove that $ST = UT$.

(Total for Question 21 is 5 marks)

22 The diagram shows a regular octagon *ABCDEFGH*.



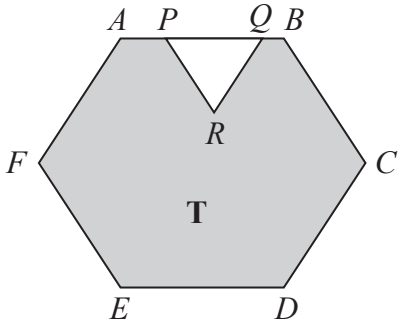
Each side of the octagon has length 10 cm.

Find the area of the shaded region *ACDEH*.
Give your answer correct to the nearest cm^2

..... cm^2

(Total for Question 22 is 6 marks)

23



The diagram shows a shaded region **T** formed by removing an equilateral triangle *PQR* from a regular hexagon *ABCDEF*.

The points *P* and *Q* lie on *AB* such that $AB = 1.5 \times PQ$

Given that the area of region **T** is $72\sqrt{3}$ cm^2

work out the length of *PQ*.

..... cm

(Total for Question 23 is 4 marks)