2

Four of the angles of a pentagon are 97°, 114°, 127° and 84°.
Work out the size of the fifth angle.

12

\( AB \) is parallel to \( DE \).
\( ACE \) and \( BCD \) are straight lines.
\( AB = 9 \text{ cm}. \)
\( AC = 7.2 \text{ cm}. \)
\( CD = 5.2 \text{ cm}. \)
\( DE = 6 \text{ cm}. \)

(a) Calculate the length of \( BC \).
(b) Calculate the length of $CE$. 

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.
14 Triangles $ABC$ and $ACD$ are similar.

Diagram NOT accurately drawn

Angle $BAC = \text{angle } CAD$.

Angle $ABC = \text{angle } ACD$.

$AB = 5\, \text{cm}$ and $AC = 8\, \text{cm}$.

(a) Calculate the length of $AD$.

The area of triangle $ABC$ is $12\, \text{cm}^2$.

(b) Calculate the area of triangle $ACD$. 
$ABCDEF$ 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 $x = 107$

(b) Work out the value of $y$. 
Triangle $ABC$ is similar to triangle $PQR$.  
$AB$ corresponds to $PQ$.  
$AC$ corresponds to $PR$.  
$AB = 8$ cm.  
$AC = 5$ cm.  
$PQ = 14$ cm.

(a) Calculate the length of $PR$. 

The area of triangle $ABC$ is $16$ cm$^2$. 

(b) Calculate the area of triangle $PQR$. 

Diagram NOT accurately drawn
The diagram shows a pentagon $ABCDE$. $DC$ is parallel to $AB$.

The size of an exterior angle at $A$ is $67^\circ$
The size of an exterior angle at $B$ is $112^\circ$
The size of an exterior angle at $C$ is $x^\circ$
The size of an exterior angle at $D$ is $74^\circ$
The size of an exterior angle at $E$ is $y^\circ$

(a) (i) Work out the value of $x$.

(ii) Work out the value of $y$.

(b) Work out the sum of the interior angles of the pentagon $ABCDE$. 
The diagram shows a regular 5-sided polygon.

(a) Work out the value of $x$.

The diagram shows a regular 6-sided polygon.

(b) Work out the value of $y$. 
The diagram shows an equilateral triangle $ABC$ and an isosceles triangle $BCD$.
$AB = AC = BC = CD$.
Angle $ABD = x^\circ$

Express the size of angle $ACD$ in terms of $x^\circ$, giving your answer as simply as possible.
Give a reason for each step in your working.

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.
The diagram shows a square $ABCD$ drawn inside a circle, centre $O$. $A$, $B$, $C$ and $D$ are points on the circle. The lengths of the sides of the square are 10 cm. $AC$ is a diameter of the circle.

Calculate the circumference of the circle. Give your answer correct to 3 significant figures.
12 In the diagram, \( \text{DAPS} \) and \( \text{CBQR} \) are straight lines. \( \text{AB} \) is parallel to \( \text{QP} \) and \( \text{DC} \) is parallel to \( \text{RS} \).
\( \text{AD} = 11 \text{ cm}, \text{ BC} = 5 \text{ cm}, \text{ PS} = 27.5 \text{ cm} \) and \( \text{RS} = 42.5 \text{ cm} \).

![Diagram NOT accurately drawn]

Quadrilateral \( \text{ABCD} \) is similar to quadrilateral \( \text{PQRS} \).

(a) Find the ratio of the length of \( \text{AB} \) to the length of \( \text{PQ} \). Give your answer in the form \( 1 : n \)

(b) Work out the length of \( \text{RQ} \).

(c) Work out the length of \( \text{CD} \).

The area of quadrilateral \( \text{ABCD} \) is \( 54 \text{ cm}^2 \)

(d) Work out the area of quadrilateral \( \text{PQRS} \).
5 Work out the size of each exterior angle of a regular polygon with 15 sides.

9 The diagram shows a parallelogram $ABCD$.
In the diagram, all the angles are in degrees.

Diagram NOT accurately drawn

Work out the value of $x$ and the value of $y$. 
9. (a) Find the sum of the interior angles of a polygon with 7 sides.

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.

14. The size of each interior angle of a regular polygon with \( n \) sides is 140°
Work out the size of each interior angle of a regular polygon with \( 2n \) sides.
3

\(ABCD\) is a parallelogram.
Angle \(DCB = 110^\circ\)
\(X\) is the point on \(DC\) such that \(AX\) bisects the angle \(DAB\).

Calculate the size of angle \(AXC\).

---

6 A steam engine for pulling trains has wheels of diameter 1.5 metres.

(a) Calculate the circumference of a wheel.
   Give your answer correct to 3 significant figures.

The steam engine travels 1000 metres along a test track.

(b) Work out the number of complete turns of a wheel.
2 Each exterior angle of a regular polygon is $15^\circ$
(a) How many sides has the regular polygon?

The diagram shows 3 identical regular pentagons.

(b) Work out the value of $y$. 

Diagram NOT accurately drawn
6

\( L MN \) is parallel to \( PQR \).
\( QM = QR \).
Angle \( RMN = x^\circ \)
Angle \( MQR = y^\circ \)

(a) Write down an expression for \( y \) in terms of \( x \).

\( ABCDEF \) is a hexagon.

(b) Work out the value of \( k \).
5

Diagram NOT accurately drawn

$ABC$ and $EDC$ are straight lines.
$AE$ is parallel to $BD$.
Angle $EAC = 40^\circ$
Angle $ACE = 30^\circ$

Work out the size of angle $x$.
Give reasons for your answer.

13 Here is a regular 10-sided polygon.

Diagram NOT accurately drawn

Work out the value of $x$.
Show your working clearly.
2

Diagram NOT accurately drawn

AB is parallel to CD
EF is a straight line.

(a) (i) Find the value of \( x \)

(ii) Give a reason for your answer.

Here is a pentagon.

Diagram NOT accurately drawn

(b) Work out the value of \( y \).
Geometry IGCSE Higher Tier Exam Questions

Jan 2016 4HR Paper

13 The diagram shows triangle $ABC$.

Diagram NOT accurately drawn

$ADB$ and $AEC$ are straight lines.
$DE$ is parallel to $BC$.
$DE = 20$ cm, $BC = 24$ cm, $AD = 22$ cm, $AC = 28.2$ cm

(a) Work out the length of $AB$.

(b) Work out the length of $EC$.

June 2016 3HR Paper

4 Work out the size of an exterior angle of a regular polygon with 8 sides.
EFG is a triangle.
AB is parallel to CD.

(a) Write down the value of \( p \)

\[ p = \ldots \]

(b) Write down the value of \( q \)

\[ q = \ldots \]

Here is a hexagon.

(c) Work out the value of \( x \)
4 Here is a kite $ABCD$.

Angle $DAB = 111^\circ$
Angle $ADC = 90^\circ$

(a) Work out the size of angle $ABC$.

Two of these kites are arranged so that a shorter side of one of the kites is placed on top of a shorter side of the other kite, as shown in the diagram below.

(b) Work out the size of angle $x$.

(c) Work out the size of angle $y$. 
3. \(ABC\) is an isosceles triangle.
   \(BA = BC\).
   \(PA\) is parallel to \(BC\).
   Angle \(ACB = 70^\circ\).

Diagram NOT accurately drawn

Find the value of \(x\).
Give a reason for each step in your working.

Nov 2010 4H Paper

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.
2.

Diagram NOT accurately drawn

$AB$ and $CPD$ are parallel straight lines.
$PQ$ and $PR$ are straight lines.

(a) 
(i) Find the value of $x$.

\[ x = \ldots \ldots \ldots \]

(ii) Give a reason for your answer.

(b) 
(i) Find the value of $y$.

(ii) Give a reason for your answer.
Geometry IGCSE Higher Tier Exam Questions

Nov 2009 3H Paper

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

Diagram NOT accurately drawn

Work out the value of $x$.

(b) A regular polygon has an exterior angle of $30^\circ$.
Work out the number of sides of the polygon.

June 2008 3H Paper

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 $n$. 
1. The diagram shows a regular 5-sided polygon, with centre $O$.

Diagram NOT accurately drawn

Work out the value of
(a) $x$,
(b) $y$.

Nov 2007 4H Paper

6. $AB$ and $CD$ are parallel straight lines. $PQ$ and $PR$ are straight lines.
(a) (i) Find the value of $x$.

\[ x = \dots \]

(ii) Give a reason for your answer.
(b) Find the value of $y$.
Give a reason for each step in your working.

Nov 2007 4H Paper

15.

Diagram NOT accurately drawn

$AB$ is parallel to $DE$.
The lines $AE$ and $BD$ intersect at the point $C$.
$AB = 15$ cm, $AC = 12.3$ cm, $CD = 6.8$ cm, $DE = 10$ cm.

(a) Work out the length of $BC$.

(b) Work out the length of $CE$.

(c) \[
\frac{\text{Area of triangle } ABC}{\text{Area of triangle } CDE} = k
\]

Work out the value of $k$. 
Geometry IGCSE Higher Tier Exam Questions

Nov 2006 4H Paper

15. 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 $n$.

June 2006 4H Paper

1. In the diagram, $ABC$ and $ADE$ are straight lines. $CE$ and $BD$ are parallel. $AB = AD$. Angle $BAD = 38^\circ$.

Work out the value of $p$.

Give a reason for each step in your working.
5. \(ABCD\) is a trapezium.
\(AB\) is parallel to \(DC\).
Angle \(BAC = 18^\circ\).
Angle \(ABC = 20^\circ\).
\(AD = DC\).

Calculate the size of angle \(ADC\).
Give a reason for each step in your working.

May 2005 3H Paper

13. The size of each exterior angle of a regular polygon is \(18^\circ\).
   
   (a) Work out how many sides the polygon has.

   (b) Work out the sum of the interior angles of the polygon.
3. In the diagram, $PQR$ and $PST$ are straight lines. $QS$ and $RT$ are parallel lines.
   Angle $QRT = 70^\circ$.
   Angle $QST = 120^\circ$.

(a) Work out the value of $x$.

(b) Give a reason for each step in your working.
20.

Diagram NOT accurately drawn

Q, R, S and T are points on the circumference of a circle.
PU is a tangent to the circle at T.
PQR is a straight line.
Angle PQT = 108°.
Angle STR = 44°.

Work out the size of angle STU.
You must give a reason for each step in your working.