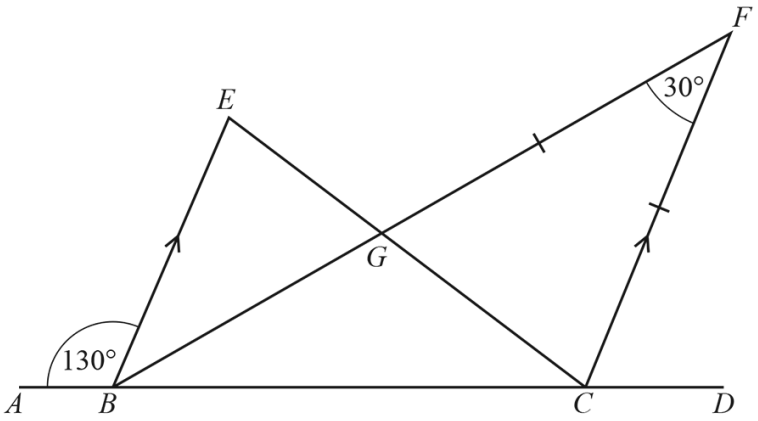
Chapter 5

Geometry

01. 0607_m24_qp_42 Q: 7

(a)



NOT TO SCALE

ABCD is a straight line and *EC* and *BF* meet at *G*.
BE is parallel to *CF* and *GF* = *CF*.
Angle *ABE* = 130° and angle *BFC* = 30°.

Find

(i) angle *FCD*

Angle *FCD* = ... [2]

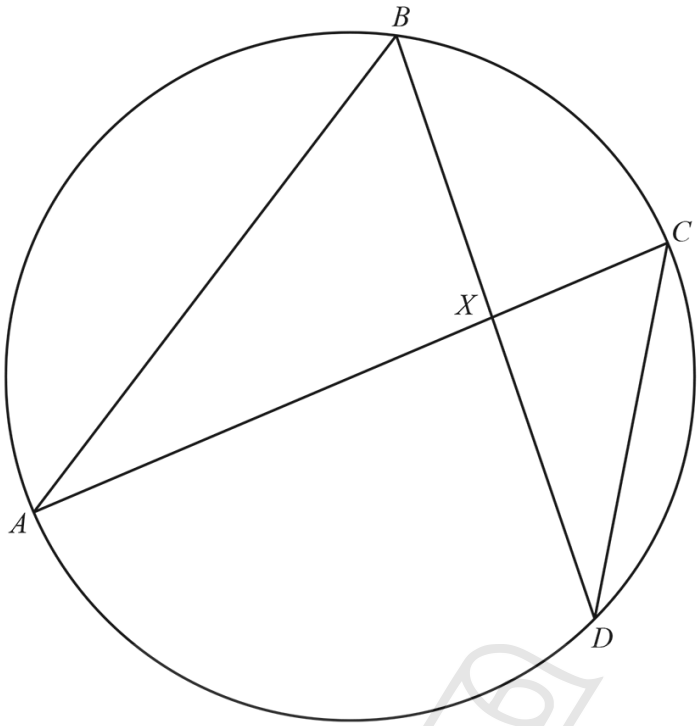
(ii) angle *FBC*

Angle *FBC* = ... [1]

(iii) angle *BGE*.

Angle *BGE* = ... [2]

(b)



NOT TO SCALE

A, B, C and D are points on the circle.
AC and BD meet at X.

(i) Show that triangles AXB and DXC are similar.
Give a reason for each statement you make.

.....

.....

.....

.....

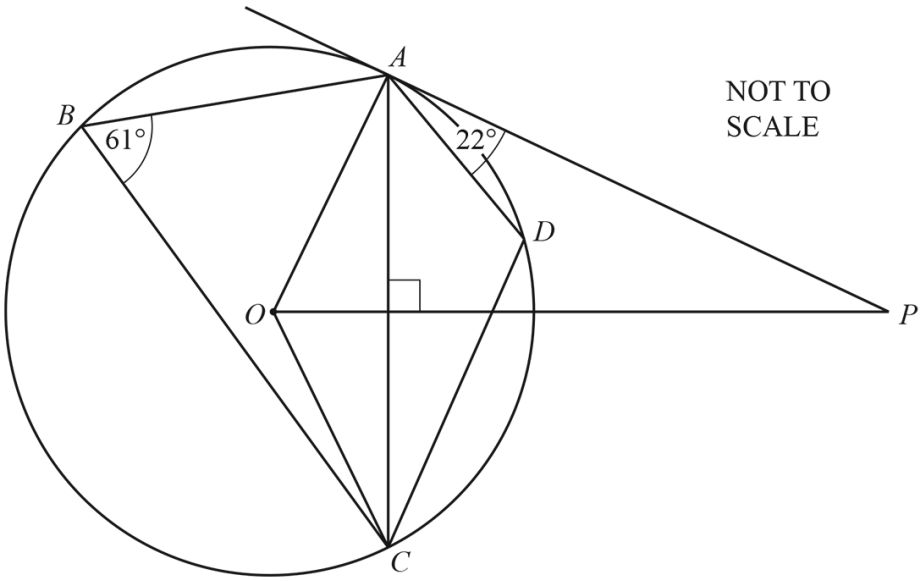
..... [2]

(ii) $AX = 5\,\text{cm}$, $XC = 2\,\text{cm}$ and $XD = 4\,\text{cm}$.

Find the length of BD.

$BD =$ ..... cm [3]

02. 0607_s24_qp_41 Q: 5



A, B, C and D lie on a circle, centre O.
AP is a tangent to the circle at A.
OP is perpendicular to AC and AD is parallel to BC.
Angle $ABC = 61°$ and angle $PAD = 22°$.

(a) Write down the mathematical name of the cyclic quadrilateral $ABCD$.

..... [1]

(b) Complete the statement.

Angle $OAP = 90°$ because .....

..... [1]

(c) Find

(i) angle ADC

Angle $ADC =$ ..... [1]

(ii) angle ACD

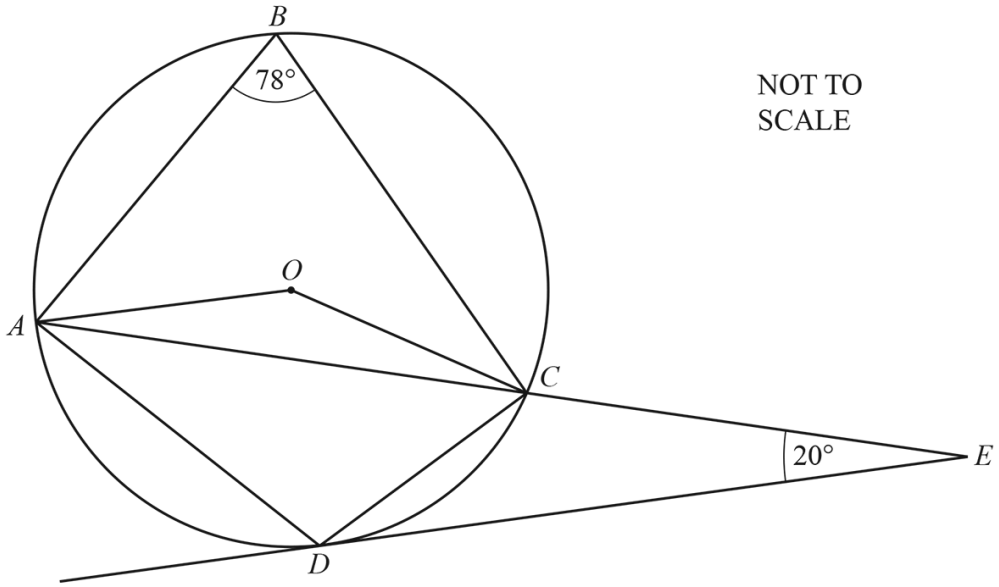
Angle $ACD =$ ..... [1]

(iii) angle ACB

Angle $ACB =$ ..... [2]

(iv) angle OCA.

Angle $OCA =$ ..... [2]



A, B, C and D lie on a circle, centre O.
DE is a tangent to the circle at D.
ACE is a straight line.

Find

(a) angle AOC

Angle AOC = ... [1]

(b) angle OAC

Angle OAC = ... [2]

(c) angle ADC

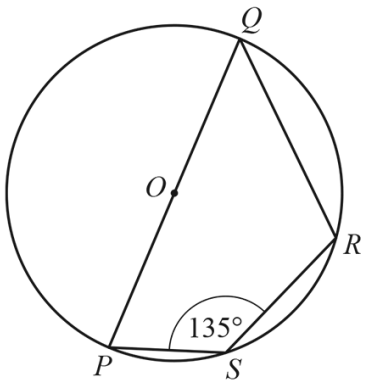
Angle ADC = ... [1]

(d) angle CAD.

Angle CAD = ... [3]

04. 0607_w23_qp_42 Q: 10

(a)



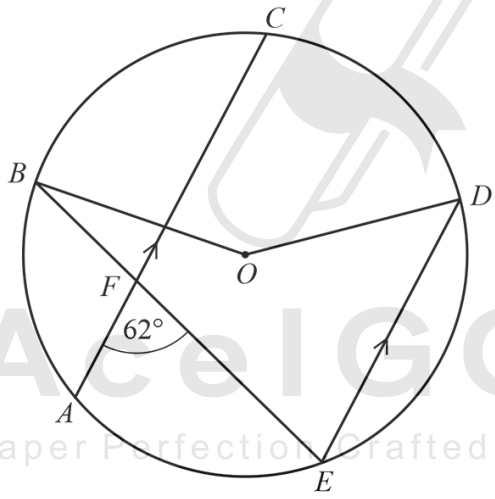
NOT TO SCALE

P, Q, R and S are points on the circle centre O.

Find angle PQR.

Angle PQR = ... [1]

(b)



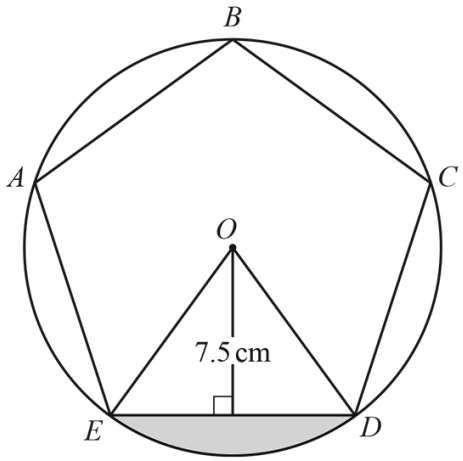
NOT TO SCALE

A, B, C, D and E are points on the circle centre O.
AC is parallel to ED.

Find the obtuse angle BOD.

Angle BOD = ... [2]

(c)



NOT TO SCALE

ABCDE is a regular pentagon.
A, *B*, *C*, *D* and *E* are points on the circle centre *O*.
The length of the perpendicular from *O* to *ED* is 7.5 cm.

(i) Show that the length of one side of the pentagon is 10.9 cm correct to 3 significant figures.

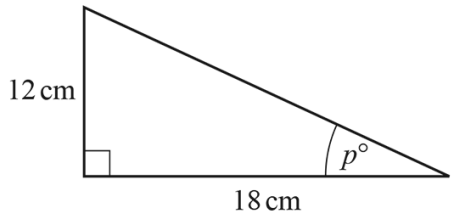
[4]

(ii) Calculate the shaded area.

..... cm^2 [4]

05. 0607_w23_qp_43 Q: 11

(a)

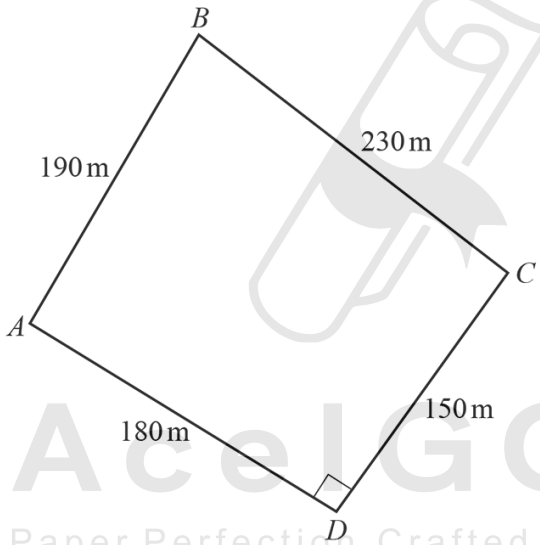


NOT TO SCALE

Calculate the value of p.

$p =$ ..... [2]

(b)



NOT TO SCALE

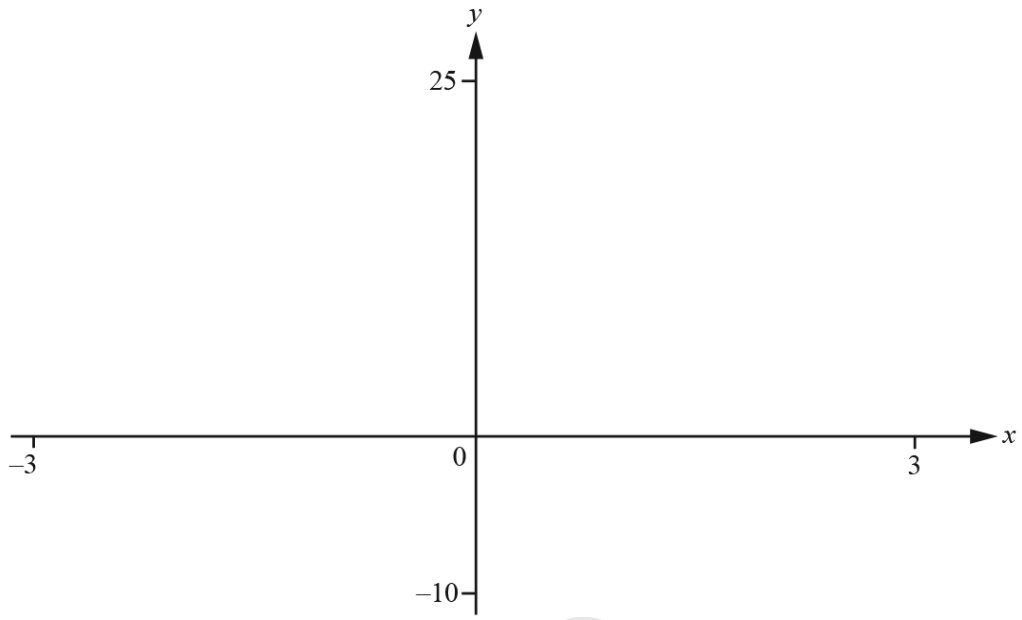
(i) Show that angle $ABC = 67.0°$ correct to 1 decimal place.

[4]

(ii) Calculate the shortest distance from A to the side BC.

..... m [3]

06. 0607_w16_qp_43 Q: 5



$f(x) = x^3 - 4x + 6$

(a) On the diagram, sketch the graph of $y = f(x)$ for $-3 \leqslant x \leqslant 3$. [2]

(b) Solve the equation $f(x) = 2x + 3$.

$x =$ ..... or $x =$ ..... or $x =$ ..... [3]

(c) **(i)** Find the co-ordinates of the local maximum point and the local minimum point.

Maximum (..... , ...)

Minimum (..... , ...) [3]

(ii) Find the range of values of k for which $f(x) = k$ has only one solution.

..... [1]

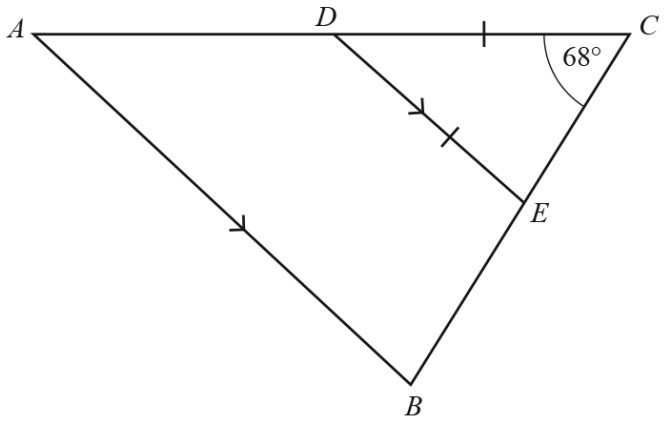
(d) Describe fully the symmetry of the graph of $y = f(x)$.

.....

..... [3]

07. 0607_s17_qp_43 Q: 2

(a)



NOT TO SCALE

In the diagram, ABC is a triangle and AB is parallel to DE.
Angle $BCA = 68°$ and $DE = DC$.

(i) Find angle BAC.

Angle BAC = ... [2]

(ii) scalene equilateral isosceles right-angled

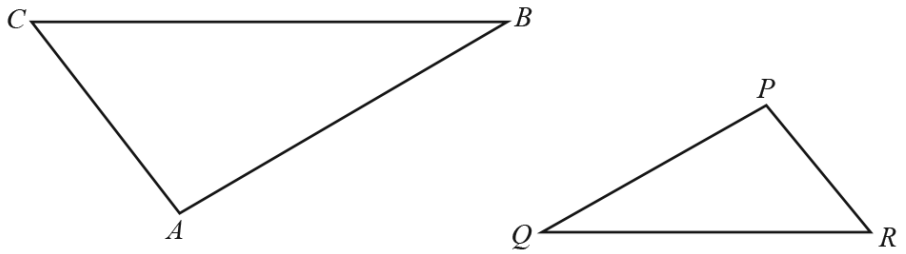
Choose one word from the list to complete the statement.

Triangle ABC is ..... [1]

(b) Calculate the interior angle of a regular 20 sided polygon.

..... [3]

(c)



NOT TO SCALE

In the diagram, angle A = angle P and angle B = angle Q.

(i) Explain why angle C = angle R.

..... [1]

(ii) $AB = 8$ cm, $AC = 5$ cm, $BC = 9$ cm and $PR = 3$ cm.

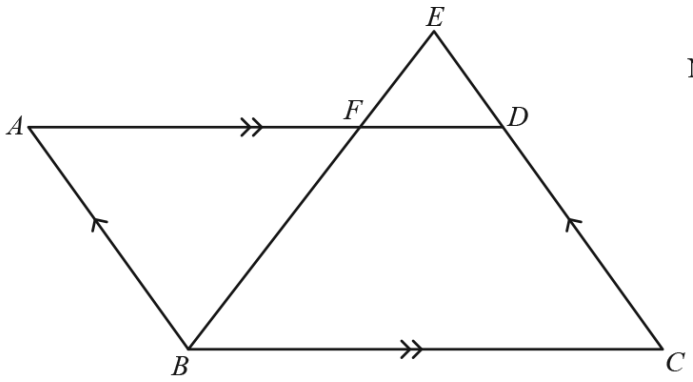
(a) Complete the statement.

Triangle ABC is ..... to triangle PQR [1]

(b) Calculate QR.

QR = ... cm [2]

08. 0607_s15_qp_42 Q: 13



NOT TO SCALE

ABCD is a parallelogram.
BFE and *CDE* are straight lines.

(a) Explain why triangles *AFB* and *DFE* are similar.

Answer(a) .....

.....

..... [2]

(b) $BC = 10$ cm, $FD = 4$ cm and $EC = 8$ cm.

(i) Calculate the length of *AB*.

Answer(b)(i) ..... cm [3]

(ii) Find the value of $\frac{\text{Area of } DFE}{\text{Area of } AFB}$.

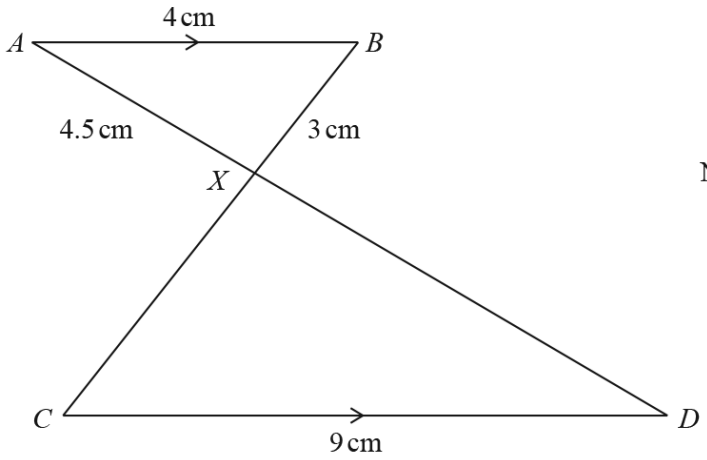
Answer(b)(ii) ..... [1]

(iii) Find the value of $\frac{\text{Area of } DFE}{\text{Area of } ABCD}$.

Answer(b)(iii) ..... [2]

09. 0607_w15_qp_41 Q: 4

(a)



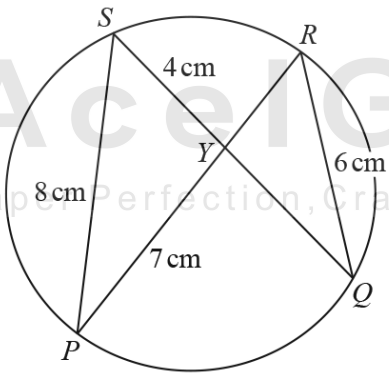
NOT TO SCALE

AB and *CD* are parallel.
AD and *CB* intersect at *X*.
CD = 9 cm, *AB* = 4 cm, *AX* = 4.5 cm and *BX* = 3 cm.

Calculate the length of *CX*.

Answer(a) ..... cm [2]

(b)



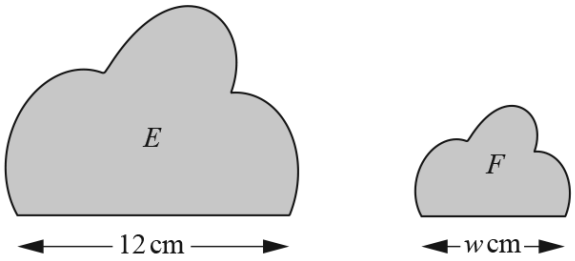
NOT TO SCALE

P, *Q*, *R* and *S* lie on a circle.
PR and *QS* intersect at *Y*.
QR = 6 cm, *PS* = 8 cm, *PY* = 7 cm and *YS* = 4 cm.

Calculate the length of *RY*.

Answer(b) ..... cm [2]

(c)



NOT TO SCALE

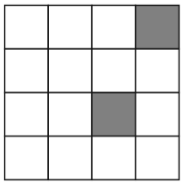
The two shapes are mathematically similar.
The area of E is $90\,cm^2$ and the area of F is $45\,cm^2$.

Find the value of w.

Answer(c) $w =$ ..... [3]

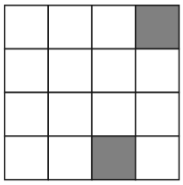
10. 0607_w15_qp_43 Q: 4

(a) **(i)** Shade in one more square so that the diagram has one line of symmetry.



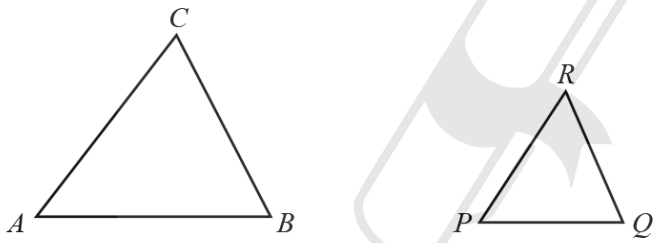
[1]

(ii) Shade in two more squares so that the diagram has rotational symmetry of order 2 and no lines of symmetry.



[1]

(b)



NOT TO SCALE

Triangle ABC and triangle PQR are mathematically similar.
$AB : PQ = 3 : 2$.

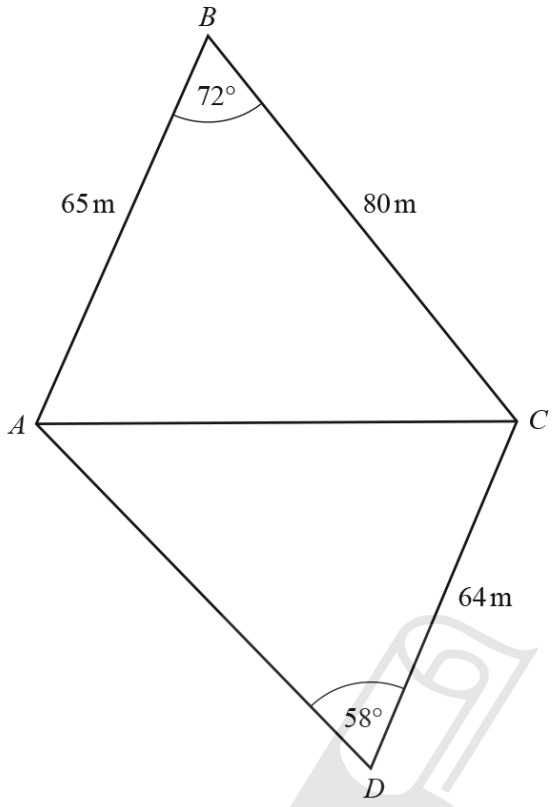
(i) $CB = 10.5$ cm.
Calculate the length of RQ.

Answer(b)(i) ..... cm [2]

(ii) The area of triangle ABC is 45 cm^2.
Calculate the area of triangle PQR.

Answer(b)(ii) ..... cm^2 [2]

11. 0607_s15_qp_41 Q: 10



(a) Find AC.

Answer(a) ..... m [2]

(b) Calculate angle CAD.

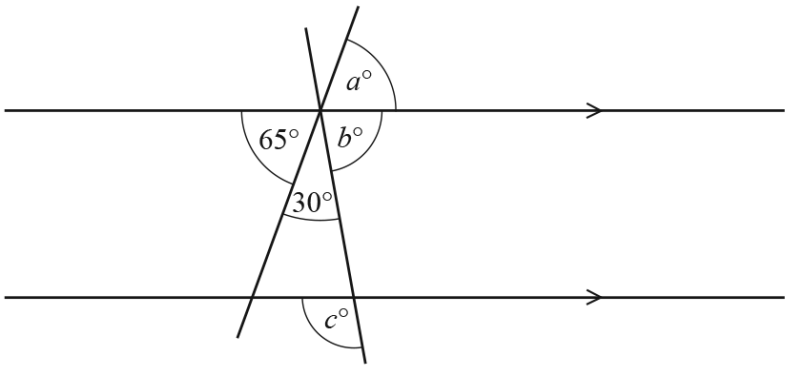
Answer(b) ..... [3]

(c) Calculate the area of the quadrilateral $ABCD$.

Answer(c) ..... m^2 [4]

12. 0607_m22_qp_42 Q: 4

(a)



NOT TO SCALE

The diagram shows two straight lines crossing two parallel lines.

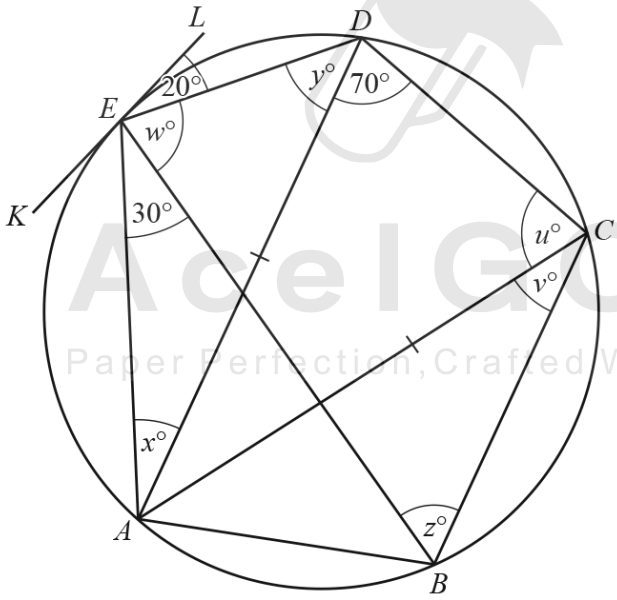
Find the values of a, b and c.

$a =$ .....

$b =$ .....

$c =$ ..... [3]

(b)



NOT TO SCALE

A, B, C, D and E are points on the circle.
KL is a tangent to the circle at E.
$AC = AD$.

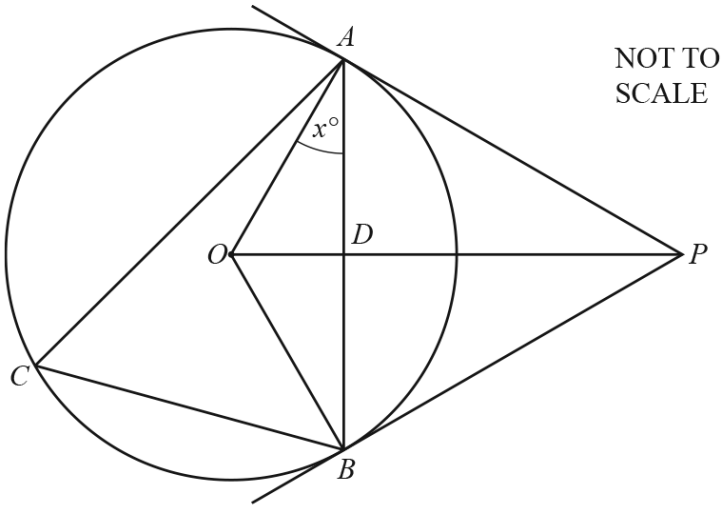
Find the values of u, v, w, x, y and z.

$u =$ ..... $x =$ .....

$v =$ ..... $y =$ .....

$w =$ ..... $z =$ ..... [6]

13. 0607_w21_qp_43 Q: 9



A, B and C lie on a circle, centre O.
AP and BP are tangents to the circle.
AB intersects OP at D and angle $OAB = x°$.

(a) Write down the size of angle OBP.

Angle OBP = ... [1]

(b) Find, in terms of x,

(i) angle AOD,

Angle AOD = ... [1]

(ii) angle ACB,

Angle ACB = ... [1]

(iii) angle APB.

Angle APB = ... [1]

(c) Write down the mathematical name of quadrilateral $AOBP$.

..... [1]

(d) Write down

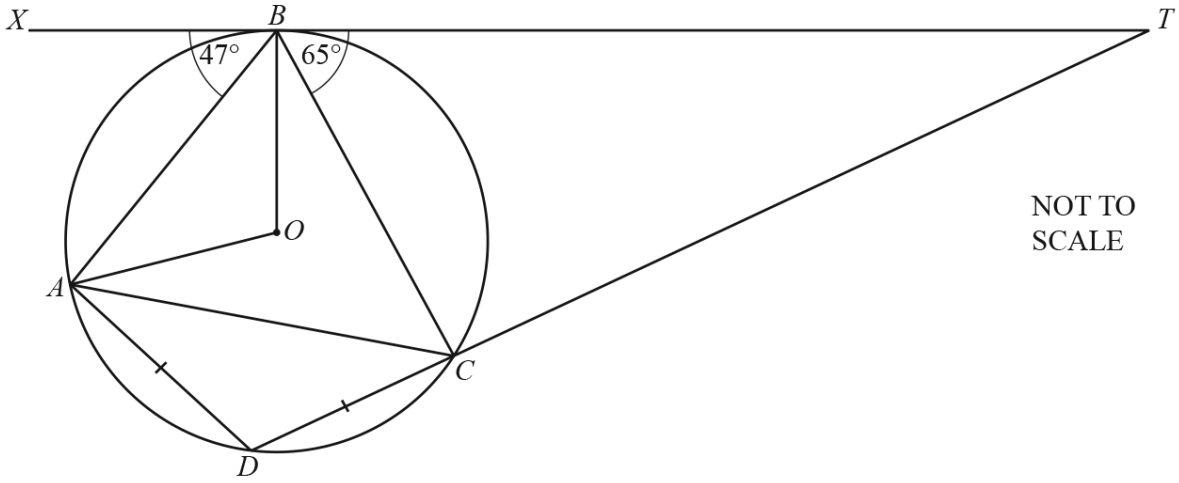
(i) two triangles that are congruent,

..... [1]

(ii) two triangles that are similar but not congruent.

..... [1]

14. 0607_w20_qp_41 Q: 5



A, B, C and D lie on a circle, centre O.
$AD = CD$ and XBT is a tangent to the circle at B.
TCD is a straight line.
Angle $XBA = 47°$ and angle $TBC = 65°$.

Find the value of

(a) angle OBX,

Angle $OBX =$ ..... [1]

(b) angle AOB,

Angle $AOB =$ ..... [2]

(c) angle CAO,

Angle $CAO =$ ..... [2]

(d) angle CDA,

Angle CDA = ... [2]

(e) angle DAC,

Angle DAC = ... [2]

(f) angle CTB.

Angle CTB = ... [2]

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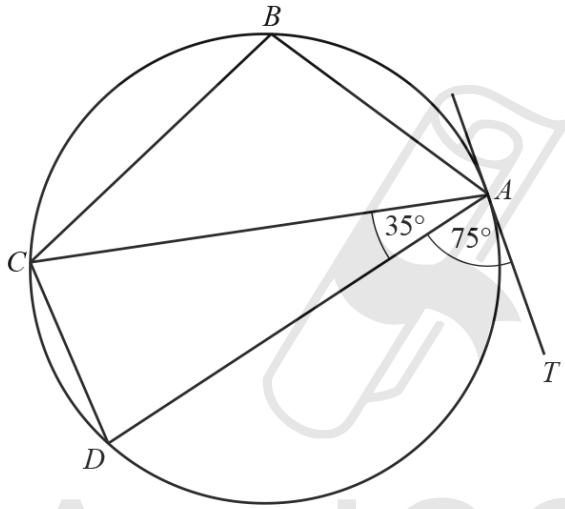
15. 0607_w20_qp_43 Q: 2

(a) Find the size of one interior angle of a regular polygon with 45 sides.

..... [3]

(b)



NOT TO SCALE

In the diagram, A, B, C and D lie on the circle.
TA is a tangent to the circle at A.
Angle $TAD = 75°$ and angle $DAC = 35°$.

Find

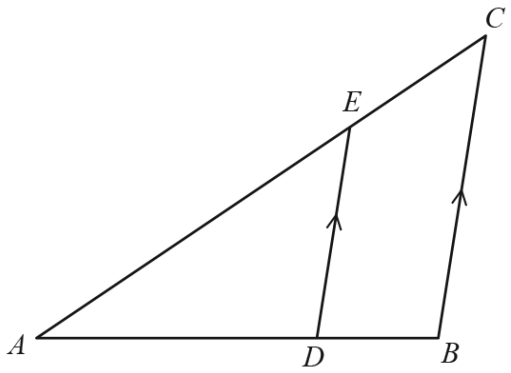
(i) angle ACD,

Angle ACD = ... [1]

(ii) angle ABC.

Angle ABC = ... [2]

(c)



NOT TO SCALE

In the diagram, DE is parallel to BC.

(i) Complete the statement.

Triangle ADE is ..... to triangle ABC. [1]

(ii) $AE = 6\,\text{cm}$, $EC = 3\,\text{cm}$ and $DB = 2\,\text{cm}$.

Calculate the length of AD.

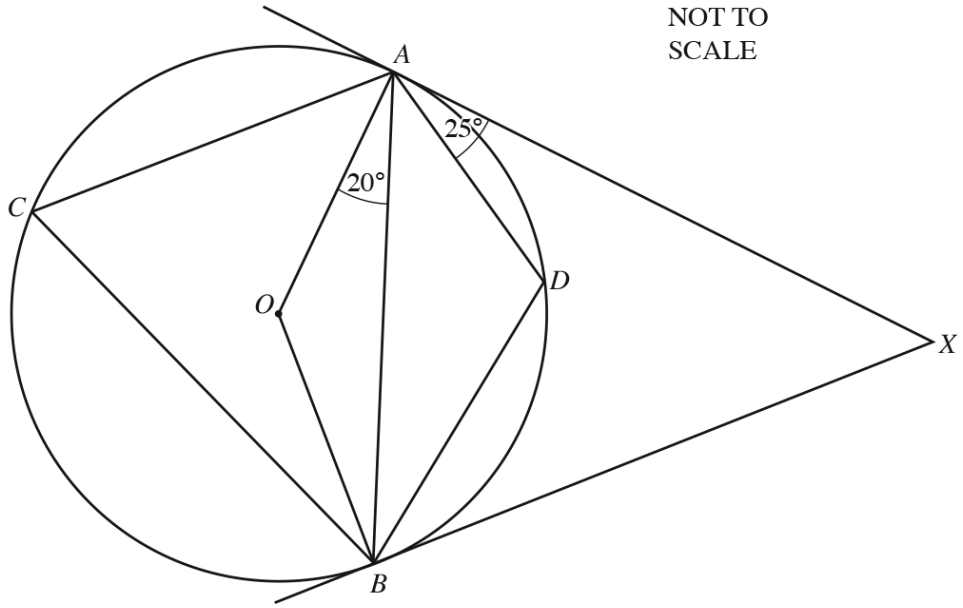
$AD =$ ..... cm [3]

(iii) The area of triangle ADE is $9\,\text{cm}^2$.

Calculate the area of triangle ABC.

..... cm^2 [2]

16. 0607_w19_qp_42 Q: 5



A, B, C and D lie on a circle, centre O.
AX is a tangent to the circle at A and BX is a tangent to the circle at B.
Angle $OAB = 20°$ and angle $DAX = 25°$.

(a) Find the value of

(i) angle AOB,

Angle AOB = ... [2]

(ii) angle ACB,

Angle ACB = ... [1]

(iii) angle ADB,

Angle ADB = ... [1]

(iv) angle *BAD*,

Angle *BAD* = ... [1]

(v) angle *DBA*,

Angle *DBA* = ... [1]

(vi) angle *AXB*.

Angle *AXB* = ... [1]

(b) What type of quadrilateral is *ACBD*?

..... [1]

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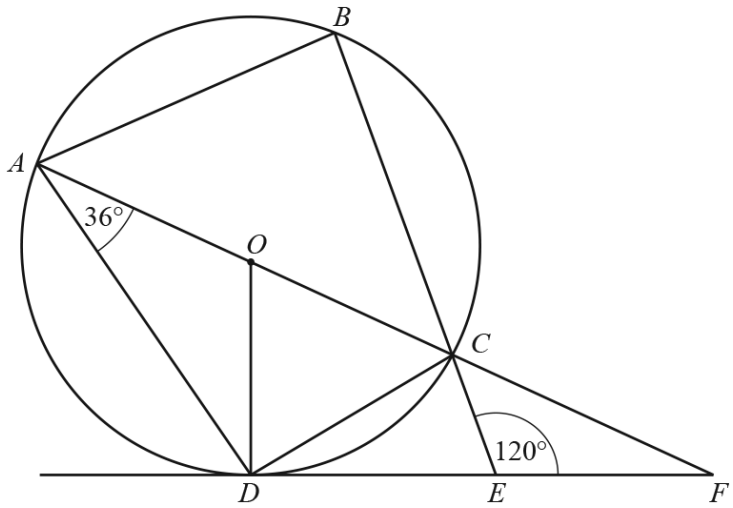
17. 0607_s18_qp_42 Q: 8



NOT TO SCALE

A, B, C and D lie on a circle, centre O.
DEF is a tangent to the circle at D.
$AOCF$ and BCE are straight lines.

(a) Complete the statement.

Angle $ODE = 90°$ because .....

..... [1]

(b) Find the value of

(i) angle AOD,

Angle AOD = ... [2]

(ii) angle ODC,

Angle ODC = ... [2]

(iii) angle ABC,

Angle ABC = ... [1]

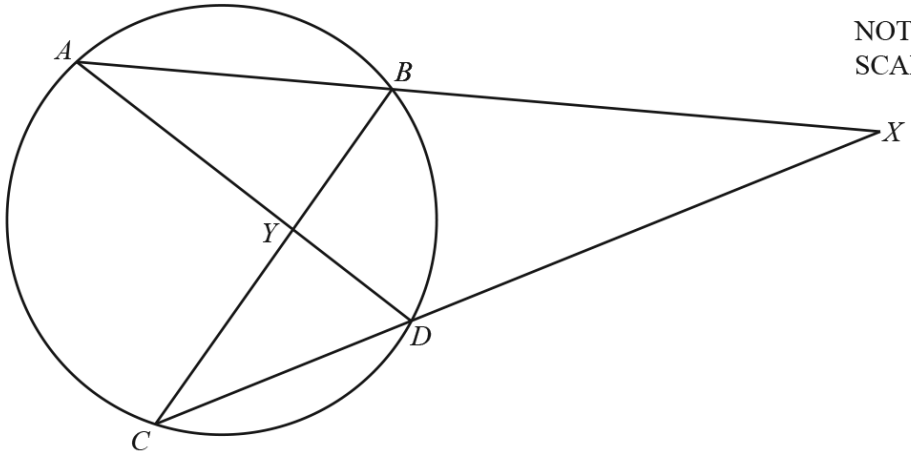
(iv) angle CFD,

Angle CFD = ... [1]

(v) angle CAB.

Angle CAB = ... [1]

18. 0607_s18_qp_43 Q: 11



NOT TO SCALE

A, B, C and D are points on the circle.
ABX, CDX, AYD and BYC are straight lines.

(a) **(i)** Explain why triangle ADX is similar to triangle CBX.

.....

.....

..... [2]

(ii) Use **part (a)(i)** to show that $XA \times XB = XC \times XD$

[1]

(b) $XB = 6\,\text{cm}$, $DC = 5\,\text{cm}$ and $XD = 7\,\text{cm}$.

Calculate the length AB.

..... cm [2]

(c) Find the value of these fractions.

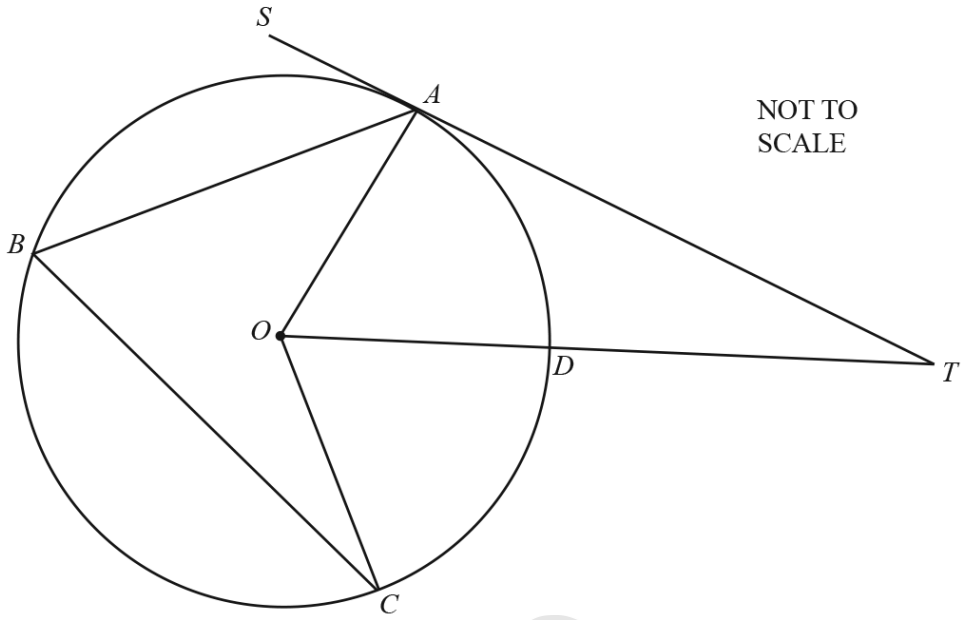
(i) $\dfrac{\text{Area of triangle } ADX}{\text{Area of triangle } CBX}$

..... [1]

(ii) $\dfrac{\text{Area of triangle } AYB}{\text{Area of triangle } CYD}$

..... [1]

19. 0607_w18_qp_41 Q: 8



A, B, C and D lie on a circle, centre O.
ST is a tangent to the circle at A.
ODT is a straight line that bisects angle AOC.

(a) Complete the statement.

Angle OAT = ... because .....

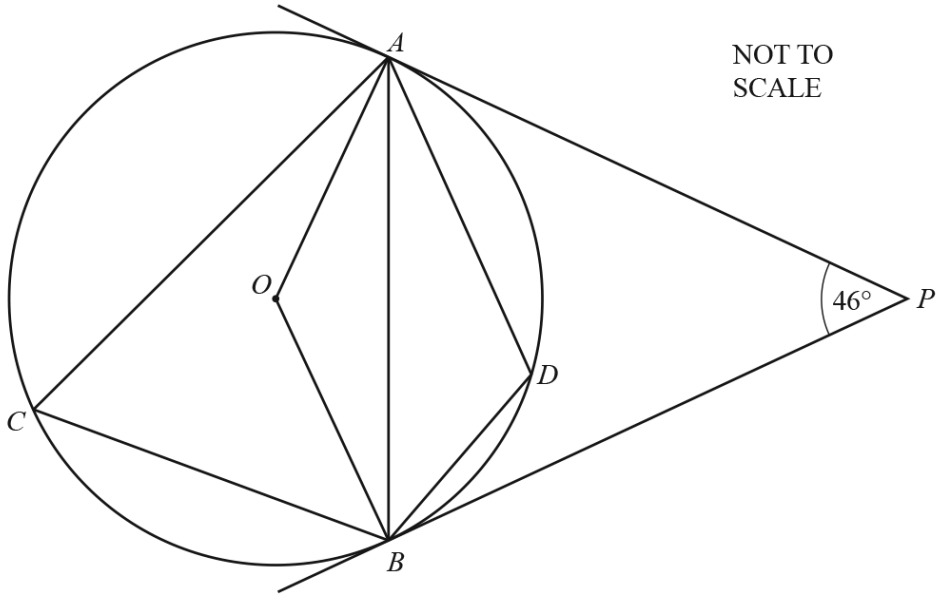
..... [2]

(b) $DT = OC$

Find angle ABC.

Angle ABC = ... [4]

20. 0607_s17_qp_41 Q: 5



A, B, C and D lie on a circle, centre O.
AP and BP are tangents to the circle.
Angle $APB = 46°$.

(a) Complete the statement.

Angle $OAP = 90°$ because .....

..... [1]

(b) Find the value of

(i) angle AOB,

Angle $AOB =$ ..... [2]

(ii) angle OAB,

Angle $OAB =$ ..... [2]

(iii) angle ACB,

Angle ACB = ... [2]

(iv) angle ADB.

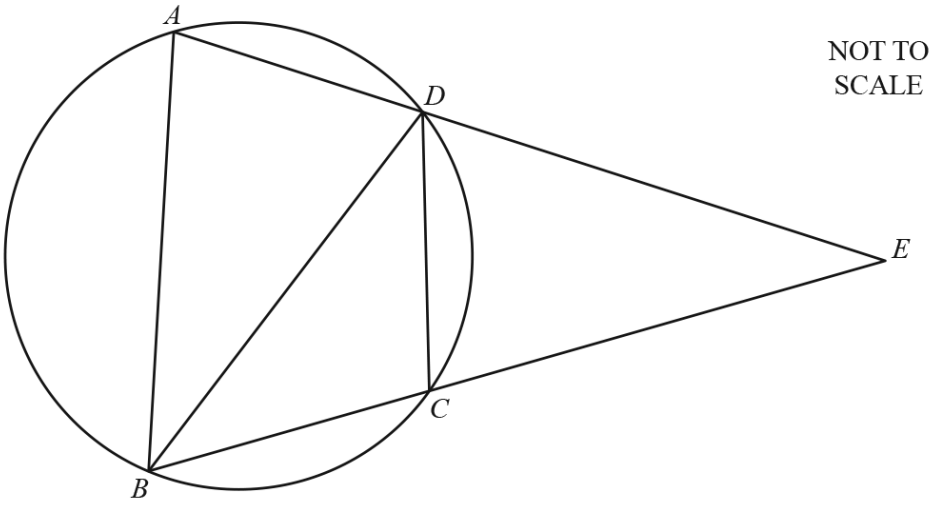
Angle ADB = ... [2]

(c) OB bisects angle ABC.

Find angle OAC.

Angle OAC = ... [3]

21. 0607_s16_qp_43 Q: 12



NOT TO SCALE

A, B, C and D lie on a circle.
ADE and BCE are straight lines that intersect at E.
$BD = DE$, angle $BAD = 4x$, angle $BCD = 6x$ and angle $BDC = 3x$.

Find

(a) x,

$x =$ ..... [2]

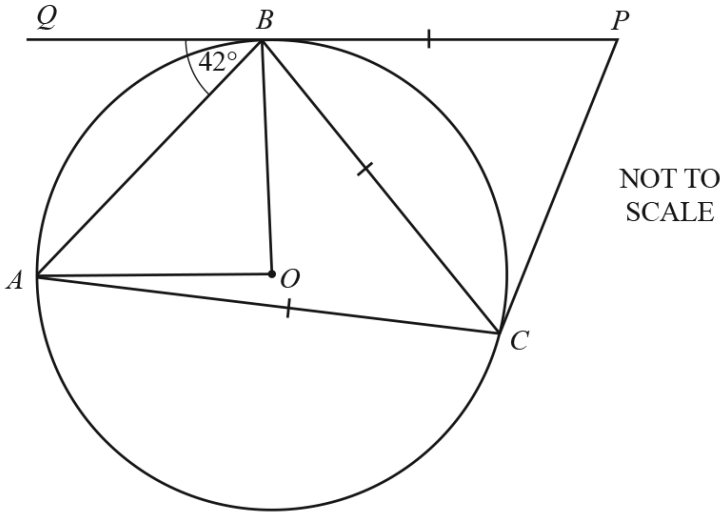
(b) angle CBD,

Angle $CBD =$ ..... [2]

(c) angle CDE.

Angle $CDE =$ ..... [3]

22. 0607_w16_qp_42 Q: 4



A, B and *C* lie on a circle, centre *O*.
The line *QBP* is a tangent to the circle at *B*.
AC = *BC* = *BP* and angle *QBA* = 42°.

Find the value of

(a) angle *OAB*,

Angle *OAB* = ... [1]

(b) angle *AOB*,

Angle *AOB* = ... [2]

(c) angle *BCA*,

Angle *BCA* = ... [1]

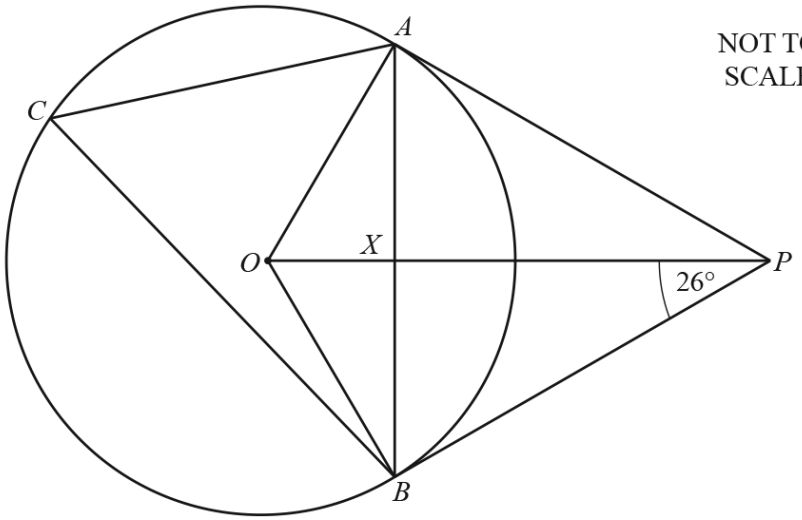
(d) angle *CBP*,

Angle *CBP* = ... [2]

(e) angle *CPB*.

Angle *CPB* = ... [2]

23. 0607_s15_qp_41 Q: 8



A, B and C lie on a circle, centre O.
AP and BP are tangents to the circle.
AB intersects OP at the point X and angle $OPB = 26°$.

(a) Find the size of

(i) angle ABP,

Answer(a)(i) ..... [1]

(ii) angle OBA,

Answer(a)(ii) ..... [1]

(iii) angle ACB.

Answer(a)(iii) ..... [1]

(b) Write down the mathematical name of quadrilateral $AOBP$.

Answer(b) ..... [1]

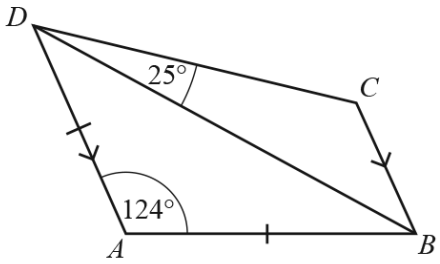
(c) Complete these statements.

(i) Triangle OBP is congruent to triangle ..... . [1]

(ii) Triangle OBP is similar, but not congruent to, triangle ..... . [1]

24. 0607_w15_qp_43 Q: 9

(a)



NOT TO SCALE

In the quadrilateral $ABCD$, $DA = AB$ and DA is parallel to CB.
Angle $DAB = 124°$ and angle $BDC = 25°$.

Calculate angle BCD.

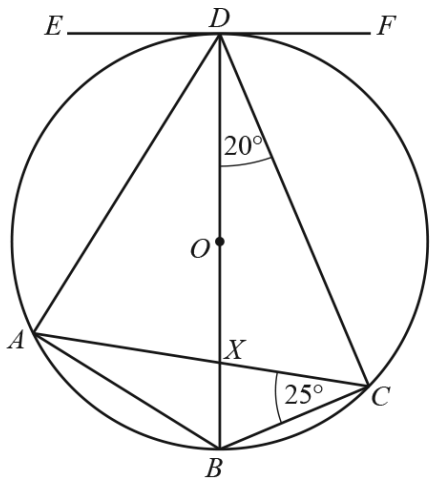
Answer(a) ..... [3]

(b) Nine of the angles of a 10-sided polygon are each 142°.

Calculate the other angle.

Answer(b) ..... [3]

(c)



NOT TO SCALE

A, B, C and D lie on the circle, centre O.
BD is a diameter and EDF is a tangent at D.
AC and BD intersect at X.

Angle $BCA = 25°$ and angle $BDC = 20°$.

Calculate

(i) angle ADE,

Answer(c)(i) ..... [2]

(ii) angle DAC,

Answer(c)(ii) ..... [2]

(iii) angle AXD.

Answer(c)(iii) ..... [1]

01. 0607_m24_ms_42 Q: 7

Question	Answer	Marks	Partial Marks
(a)(i)	50	**2**	**B1** for angle $BCF = 130$ or angle $EBC = 50$ soi by angle $EBG = 30$ and angle $GBC = 20$ or angle $FCG = 75$ and angle $GCB = 55$
(a)(ii)	20	**1**	

Question	Answer	Marks	Partial Marks
(a)(iii)	75	**2**	**M1** for $\frac{180-30}{2}$
(b)(i)	2 from Angle AXB = Angle DXC [Vertically] opposite angles Angle ABX = Angle DCX Angles in same segment. Angle BAX = Angle CDX Angles in same segment. And conclusion AA[A]	**2**	**B1** for 2 pairs correct with no/incorrect reasons and conclusion or for one pair correct with reason.
(b)(ii)	6.5	**3**	**B2** for $BX = 2.5$ or **M1** for $\frac{\cdots}{2} = \frac{5}{4}$ oe

02. 0607_s24_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)	trapezium	**1**	

Question	Answer	Marks	Partial Marks
(b)	Angle between tangent and radius oe	**1**	
(c)(i)	119	**1**	
(c)(ii)	22	**1**	
(c)(iii)	39	**2**	**M1** for 180 – *their* **(i)** – *their* **(ii)**
(c)(iv)	29	**2**	**B1** for 61 or 122 at centre (may be on diagram)

03. 0607_s23_ms_43 Q: 10

Question	Answer	Marks	Partial Marks
(a)	156	**1**	
(b)	12	**2**	**M1** for $\frac{180-their(a)}{2}$
(c)	102	**1**	
(d)	29	**3**	**M2** for $x+x+their102+20=180$ oe or **M1** for indicating angle CDE = angle DAC

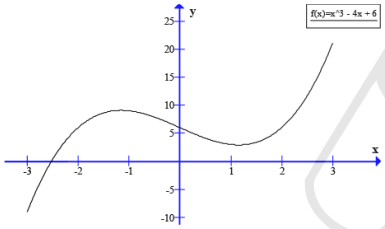
04. 0607_w23_ms_42 Q: 10

Question	Answer	Marks	Partial Marks
(a)	45	**1**	
(b)	124	**2**	**B1** for $BED=62$
(c)(i)	[EOD=] 72 or [ODE=] 54	**B1**	seen or implied by 36
	$2\times7.5\times\tan36$ oe or $2\times\frac{7.5}{\tan54}$	**M2**	**M1** for $\tan(36)=\frac{halfside}{7.5}$ or $\tan54=\frac{7.5}{halfside}$
	10.89….	**A1**	no errors or omissions
(c)(ii)	13.1 or 13.11 to 13.13…	**4**	**M1** $r^2=7.5^2+\left(\frac{10.9}{2}\right)^2$ or better or trig method for r **M1** $\frac{1}{2}\times10.9\times7.5$ or $\frac{1}{2}\times their\ r^2\times their\sin72$ oe **M1** $\frac{their72}{360}\times\pi\times their\ r^2$ oe

05. 0607_w23_ms_43 Q: 11

Question	Answer	Marks	Partial Marks
(a)	33.7 or 33.69...	**2**	**M1** for $\tan[p] = \frac{12}{18}$
(b)(i)	$150^2 + 180^2$	**M1**	
	$[\cos=]\frac{192^2 + 230^2 - their(180^2 + 150^2)}{2 \times 190 \times 230}$	**M2**	**M1** for *their* $(180^2 + 150^2) = 190^2 + 230^2 - 2 \times 190 \times 230 \cos B$
	67.03 to 67.04	**A1**	
(b)(ii)	175 or 174.8 to 174.9...	**3**	**M2** for $\sin 67[.0] = \frac{x}{190}$ oe or **M1** for distance required is perpendicular to BC oe

06. 0607_w16_ms_43 Q: 5

Question	Answer	Mark	Part Marks
(a)	Correct sketch 	**2**	**B1** for correct cubic shape with maximum on left of minimum
(b)	–2.67 or –2.669 ... 0.524 or 0.5239 to 0.5240 2.15 or 2.145...	**1** **1** **1**	
(c) (i)	Maximum (–1.15, 9.08) Minimum (1.15, 2.92)	**3**	or (–1.155 to –1.154, 9.079...) or (1.154 to 1.155, 2.920 to 2.921) **B2** for either maximum or minimum or **B1** for 1 correct value
(ii)	$k < 2.92$ and $k > 9.08$	**1FT**	or above accuracy.
(d)	Rotational Order 2 (0, 6)	**1** **1** **1**	

07. 0607_s17_ms_43 Q: 2

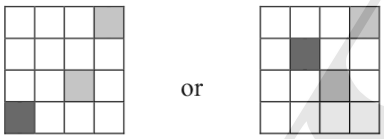
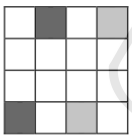
Question	Answer	Marks	Part Marks
(a)(i)	44	**2**	**M1** for [angle *BAC* or *DEC* =] 180 – 2 × 68, soi by angle *CDE* = 44 or **M1** for angle *BAC* = *their* angle *CDE*
(a)(ii)	isosceles	**1**	
(b)	162	**3**	**M2** for $180 - \frac{360}{20}$ or $\frac{180\times(20-2)}{20}$ or **M1** for $\frac{360}{20}$ or 180 × (20 – 2)
(c)(i)	Angle sum of triangle oe	**1**	
(c)(ii)(a)	similar	**1**	
(c)(ii)(b)	5.4	**2**	**M1** for $\frac{5}{3}=\frac{9}{QR}$ oe

Qu.	Answer	Mark	Part Marks
(a)	*ABF* = *DEF* (alternate angles) *BAF* = *EDF* (alternate angles) *AFB* = *DFE* ([vert] opposite angles)	**1 + 1**	One mark for first fully correct and one for second fully correct. or **B1** for any 2 pairs of angles identified without a reason or with an incorrect reason
(b) (i)	4.8 oe	**3**	Method 1 Triangles *ABF, CEB* [where $x = AB$] **M2** for $\frac{10}{6}=\frac{8}{x}$ oe or **M1** for $\frac{BC}{AF}=\frac{EC}{AB}$ oe Method 2 Triangles *ABF, DEF* [where $x = AB$] **M2** for $\frac{8-x}{x}=\frac{4}{6}$ oe or **M1** for $\frac{FD}{AF}=\frac{ED}{AB}$ oe Method 3 Triangles *EFD, EBC* [where $y = ED$] **M2** for $ED = 3.2$ or **M1** for $\frac{BC}{FD}=\frac{EC}{ED}\left[=\frac{10}{4}=\frac{8}{y}\right]$ oe
(ii)	$\frac{4}{9}$ oe	**1**	
(iii)	$\frac{4}{30}$ oe	**2**	**M1** for Area of $ABF = \frac{3}{10}$ Area of *ABCD* or ratio of *EFD* to *EBC* = 4 : 25 oe soi or correct use of $\frac{1}{2}ab\sin C$ or e.g. $\frac{\frac{1}{2}\times theirED\times 4}{10\times theirDC}$

09. 0607_w15_ms_41 Q: 4

Question	Answer	Mark	Part Marks
(a)	6.75	2	**M1** for $\frac{4}{9}=\frac{3}{CX}$ oe or better
(b)	3	2	**M1** for $\frac{8}{6}=\frac{4}{RY}$ oe or better
(c)	8.49 or 8.484 to 8.485…	3	**M2** for $\frac{12}{w}=\sqrt{\frac{90}{45}}$ oe or better or **M1** for $\sqrt{\frac{90}{45}}$ or $\sqrt{\frac{45}{90}}$ oe soi or $\left(\frac{12}{w}\right)^2=\frac{90}{45}$ oe

10. 0607_w15_ms_43 Q: 4

Question	Answer	Mark	Part Marks
(a) (i)		1	
(ii)		1	
(b) (i)	7	2	**M1** for $\frac{3}{2}=\frac{10.5}{RQ}$ oe or better
(ii)	20	2	**M1** for $\left(\frac{3}{2}\right)^2$ or $\left(\frac{2}{3}\right)^2$ oe

11. 0607_s15_ms_41 Q: 10

Qu.	Answer	Mark	Part Marks
(a)	86.1 or 86.08 to 86.09	2	**M1** for $65^2 + 80^2 - 2 \times 65 \times 80 \times \cos 72$
(b)	39.1 or 39.07 to 39.09	3	**M2FT** for $[\sin A =] \frac{64 \times \sin 58}{\textit{their}}$ **(a)** or **M1FT** for $\frac{64}{\sin A}=\frac{\textit{their}\ 86.1}{\sin 58}$ oe
(c)	5210 or 5206 to 5207	4FT	**M1** for $0.5 \times 65 \times 80 \times \sin 72$ **M2FT** for $0.5 \times 64 \times$ *their* 86.1$\times \sin$ (180 – 58 – *their* **(b)**) oe or **M1** for [angle ACD] = 180 – 58 – *their* **(b)**

12. 0607_m22_ms_42 Q: 4

Question	Answer	Marks	Partial Marks
(a)	[a =] 65 [b =] 85 [c =] 95	**3**	**B1** for each
(b)	[u =] 70 [v =] 30 [w =] 80 [x =] 20 [y =] 50 [z =] 60	**6**	**B1** for each **FT** 180 – *their u* – *their v* **FT** 150 – *their x* – *their w* **FT** 110 – *their y*

13. 0607_w21_ms_43 Q: 9

Question	Answer	Marks	Partial Marks
(a)	90	**1**	
(b)(i)	$90 - x$ oe	**1**	
(b)(ii)	$90 - x$ oe	**1**	
(b)(iii)	$2x$	**1**	
(c)	Kite	**1**	
(d)(i)	*OAD* and *OBD* or *OAP* and *OBP* or *ADP* and *BDP*	**1**	

Question	Answer	Marks	Partial Marks
(d)(ii)	One from one of pairs in part **(i)** and One from one of other pairs in part **(i)**	**1**	

14. 0607_w20_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)	90	**1**	
(b)	94	**2**	**M1** for $180 - 43 - 43$ or 2×47

Question	Answer	Marks	Partial Marks
(c)	22	**2**	**B1** for $CAB = 65$ or $ACB = 47$
(d)	112	**2**	**M1** for 180 – *their ABC*
(e)	34	**2**	**FT** *their* **(d)** **M1** for (180 – *their***(d)**)/2
(f)	16	**2**	**B1** for $BCT = 99$

15. 0607_w20_ms_43 Q: 2

Question	Answer	Marks	Partial Marks
(a)	172	**3**	**M2** for $180-\frac{360}{45}$ or for $\frac{180\times(45-2)}{45}$ or **M1** for $\frac{360}{45}$ (implied by 8) or for $180 \times (45 - 2)$ (implied by 7740)
(b)(i)	75	**1**	
(b)(ii)	110	**2**	**B1** for angle $CAT = 110$ or angle $CDA = 70$ or **M1** for 180 – *their* angle *CDA*.
(c)(i)	similar	**1**	
(c)(ii)	4	**3**	**M2** for $\frac{9}{6}=\frac{AD+2}{AD}$ oe or **M1** for $\frac{AD}{AB}=\frac{6}{9}$ oe
(c)(iii)	20.25	**2**	**M1** for $\left(\frac{3}{2}\right)^2$ or $\left(\frac{2}{3}\right)^2$ oe seen

16. 0607_w19_ms_42 Q: 5

Question	Answer	Marks	Partial Marks
(a)(i)	140	**2**	**B1** for angle $OBA = 20$ soi
(a)(ii)	70	**1**	**FT** $0.5\times$ *their*(i)
(a)(iii)	110	**1**	**FT** 180 – *their*(ii)

Question	Answer	Marks	Partial Marks
(a)(iv)	45	**1**	
(a) (v)	25	**1**	
(a)(vi)	40	**1**	
(b)	Cyclic [quadrilateral]	**1**	

17. 0607_s18_ms_42 Q: 8

Question	Answer	Marks	Partial Marks
(a)	[Angle between] tangent and radius/diameter	**1**	
(b)(i)	108	**2**	**M1** for $ADO = 36$ soi

Question	Answer	Marks	Partial Marks
(b)(ii)	54	**2**	**M1** for $\frac{their\textbf{(b)(i)}}{2}$ or $90 - 36$ or $\frac{180-72}{2}$
(b)(iii)	90	**1**	
(b)(iv)	18	**1**	
(b)(v)	48	**1**	

18. 0607_s18_ms_43 Q: 11

Question	Answer	Marks	Partial Marks
(a)(i)	Angle X is common oe $\angle XCB = \angle XAD$ (angles in same segment) oe	**2**	**B1** for each If 0 scored **SC1** for 2 pairs of angles without reasons
(a)(ii)	$\frac{XA}{XC} = \frac{XD}{XB}$ oe	**1**	
(b)	8	**2**	**M1** for $12 \times 7 = XA \times 6$ soi (implied by 14)
(c)(i)	$\frac{49}{36}$ oe	**1**	
(c)(ii)	$\frac{64}{25}$ oe	**1**	

19. 0607_w18_ms_41 Q: 8

Question	Answer	Marks	Partial Marks
(a)	90 Angle [between] tangent and radius oe	**2**	**B1** for each
(b)	60	**4**	**B3** for angle $AOT = 60$ or **M2** for $\sin(OAT) = \frac{1}{2}$ or $\cos(AOT) = \frac{1}{2}$ oe or **M1** for $OT = 2OA$ oe

20. 0607_s17_ms_41 Q: 5

Question	Answer	Marks	Partial Marks
(a)	[Angle between] tangent [and] radius / diameter [=90] oe	**1**	
(b)(i)	134	**2**	**M1** for 360 – 90 – 90 – 46 oe
(b)(ii)	23	**2**	**M1** for (180 – *their* (i)) ÷ 2 oe
(b)(iii)	67	**2**	**FT** (*their* (i)) ÷ 2 **M1** for (*their* (i)) ÷ 2 oe
(b)(iv)	113	**2**	**FT** 180 – *their* (iii) or (360 – *their* (i)) ÷ 2 **M1** for 180 – *their* (iii) or (360 – *their* (i)) ÷ 2 oe
(c)	44	**3**	**M2** for 180 – 67 – 23 – 23 – 23 oe or 360 – 226 – 67 – 23 oe or **B1** for angle *OBC* = 23 or 226 seen

21. 0607_s16_ms_43 Q: 12

Question	Answer	Mark	Part Marks
(a)	18	**2**	**M1** for $4x + 6x = 180$
(b)	18	**2**	**M1** for $180 - 6x - 3x$
(c)	90	**3**	**M2** for $180 - 3x - x - x$ or **B1** for $CED = x$ or $DCE = 4x$

22. 0607_w16_ms_42 Q: 4

Question	Answer	Mark	Part Marks
(a)	48	**1**	
(b)	84	**2**	**FT** (180 – 2 × *their* (a)), *their* (a) ≠ 45 **M1** for (180 – 2 × *their* (a)) *their* (a) ≠ 45
(c)	42	**1**	**FT** *their* (b) ÷ 2
(d)	69 cao	**2**	**B1** for angle *OBC* or *OAC* = 21 or angle *ABC* = 69
(e)	55.5	**2**	**FT** *their* (d) **M1** for (180 – *their* (d)) ÷ 2

23. 0607_s15_ms_41 Q: 8

Qu.	Answer	Mark	Part Marks
(a) (i)	64	**1**	
(ii)	26	**1FT**	**FT** 90 – *their* **(a)(i)**
(iii)	64	**1**	
(b)	Kite or Cyclic Quadrilateral	**1**	
(c) (i)	*OAP*	**1**	
(ii)	*OXB* or *OXA*	**1**	

24. 0607_w15_ms_43 Q: 9

Question	Answer	Mark	Part Marks
(a)	127	**3**	**M1** for angle *ADB* or *ABD* $= 0.5(180-124)$ implied by 28 in diagram **M1** for angle *DBC* = angle *ADB*.
(b)	162	**3**	**M2** for $(10-2) \times 180 - 9 \times 142$ or **M1** for $(10-2) \times 180$
(c) (i)	65	**2**	**B1** for angle *ADB* = 25 or angle *ACD* = 65
(ii)	70	**2**	**B1** for angle *BAC* = 20 or angle *FDC* = 70
(iii)	85	**1**	