

CIRCLE THEOREMS (FOUNDATION)

GRADE 5

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Q1.

AtoZrevision.com

L , M and P are points on a circle, centre O
Angle $LMP = 48^\circ$

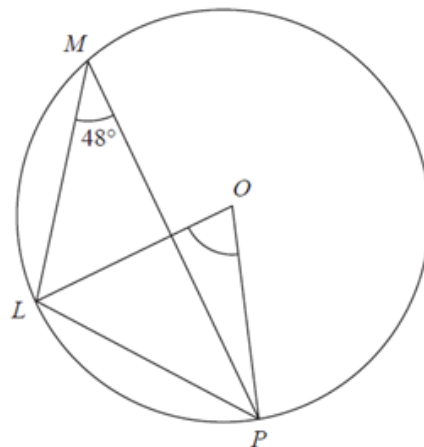


Diagram **NOT**
accurately drawn

Write down the size of angle LOP

96°

(1 mark)

Q2.

AtoZrevision.com

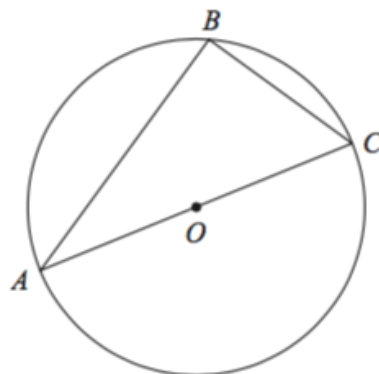


Diagram **NOT**
accurately drawn

A , B and C are points on the circumference of a circle, centre O . AC is a diameter of the circle.

Write down the size of angle ABC .

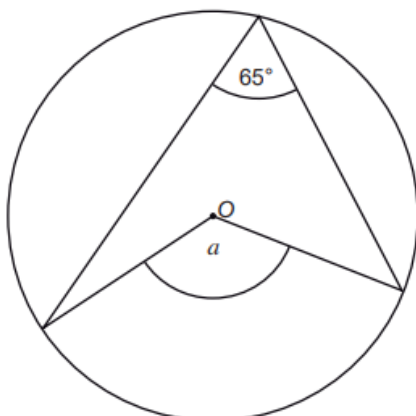
90°

(1 mark)

Q3.

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O is the centre of the circle.



Not drawn
accurately

What is the size of angle a ?

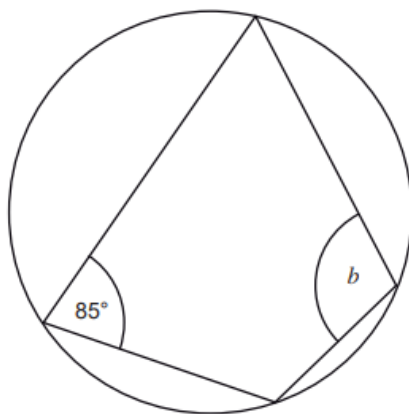
130°

(1 mark)

Q4.

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Work out the size of angle b .



Not drawn
accurately

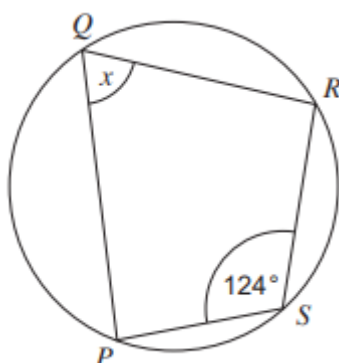
95°

(1 mark)

Q5.

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P , Q , R and S are points on the circumference of the circle.



Not drawn
accurately

Work out the size of angle x .

56°

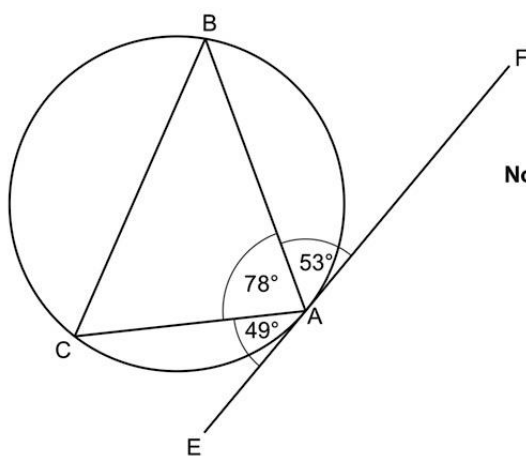
(1 mark)

Q6.

AtoZrevision.com

Points A , B and C lie on the circumference of a circle.

EAF is a tangent to the circle.



Not to scale

Write down the value of angle BCA .

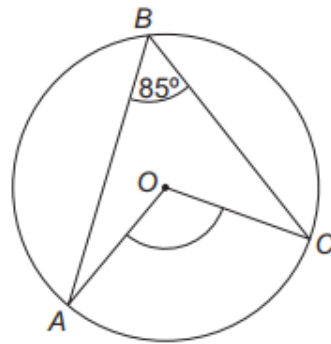
53°

(1 mark)

Q7.

AtoZrevision.com

The diagram shows a circle, centre O .



Not drawn
accurately

Work out the size of angle AOC .

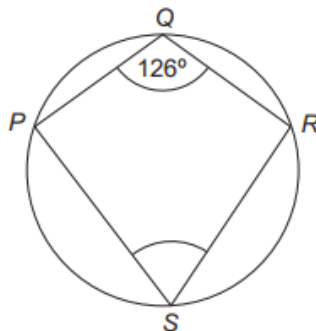
170°

(1 mark)

Q8.

AtoZrevision.com

P , Q , R and S are points on the circumference of a circle.



Not drawn
accurately

Work out the size of angle PSR .

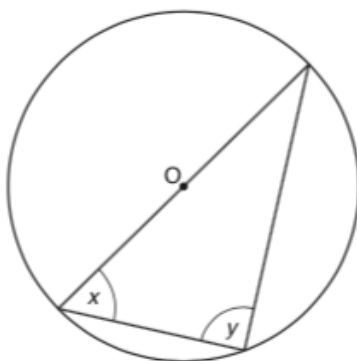
54°

(1 mark)

Q9.

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This is a triangle in a circle with centre O.



What type of angle is y?

RIGHT-ANGLE

(1 mark)

Q10.

AtoZrevision.com

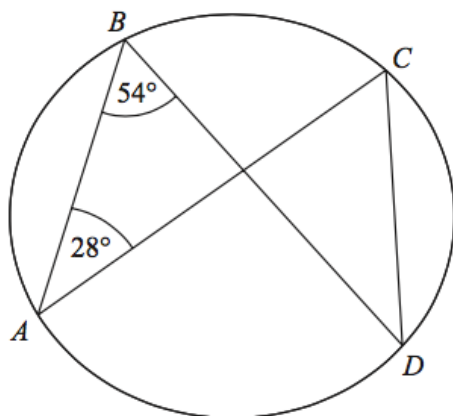


Diagram NOT
accurately drawn

A, B, C and D are points on the circumference of a circle.

Angle $ABD = 54^\circ$.

Angle $BAC = 28^\circ$.

Find the size of angle ACD.

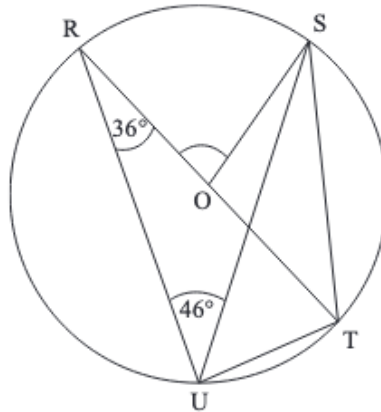
54°

(1 mark)

Q11.

AtoZrevision.com

R, S, T and U are points on the circumference of a circle, centre O.
The angle RUS is 46° and the angle URT is 36°



Calculate the angle RTS.

46°

(1 mark)

Q12.

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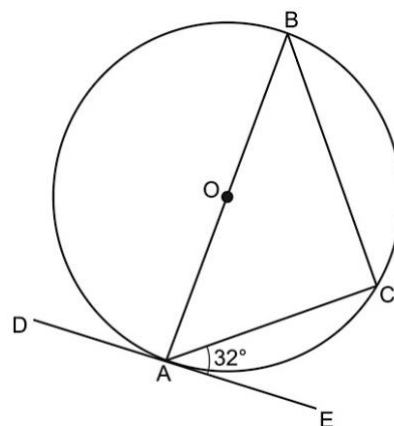
The diagram shows a circle, centre O.

Points A, B and C lie on the circumference of the circle.

Line AOB is a diameter.

Line DAE is a tangent to the circle.

Angle CAE = 32° .



Not to scale

Explain why angle ACB is a right angle.

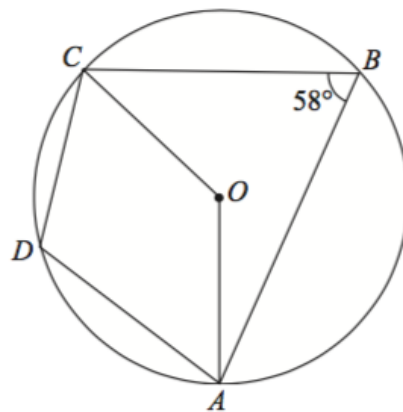
ANGLE IN A SEMI-CIRCLE IS

90°

(1 mark)

Q13.

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Diagram **NOT**
accurately drawn

A, B, C and D are points on a circle, centre O.
Angle $ABC = 58^\circ$.

Calculate the size of angle ADC.

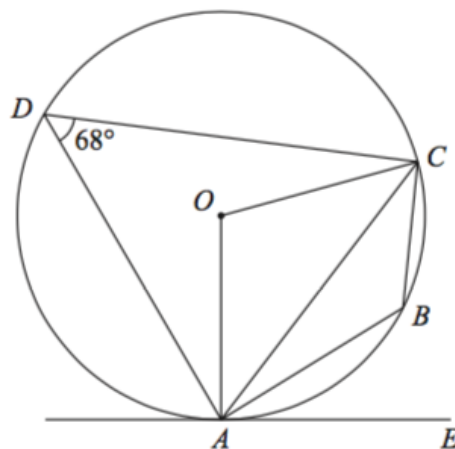
$$180 - 58 =$$

$$122^\circ$$

(1 mark)

Q14.

AtoZrevision.com

Diagram **NOT**
accurately drawn

A, B, C and D are points on a circle, centre O.
AE is a tangent to the circle.
Angle $ADC = 68^\circ$.

Find the size of angle CAE.

$$68^\circ$$

(1 mark)

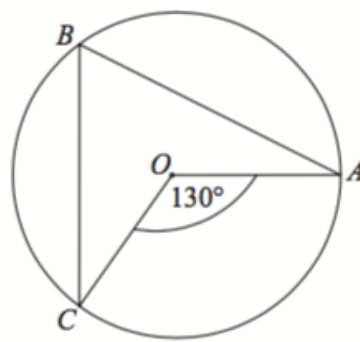


Diagram NOT
accurately drawn

In the diagram, O is the centre of the circle.

A, B and C are points on the circle.

Angle COA = 130° .

Give a reason why angle CBA = 65° .

ANGLE AT CENTRE IS TWICE
THE ANGLE AT THE CIRCUMFERENCE

(1 mark)

HARDER QUESTIONS

Q16.

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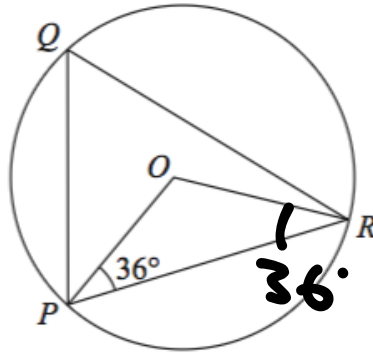


Diagram NOT
accurately drawn

P , Q and R are points on a circle, centre O .
Angle $OPR = 36^\circ$.

Work out the size of angle PQR .

$$36 + 36 = 72^\circ$$

(M1)

$$PQR = 180 - 72 =$$

(M1)

(A1)

$$108^\circ$$

.....

(3 marks)

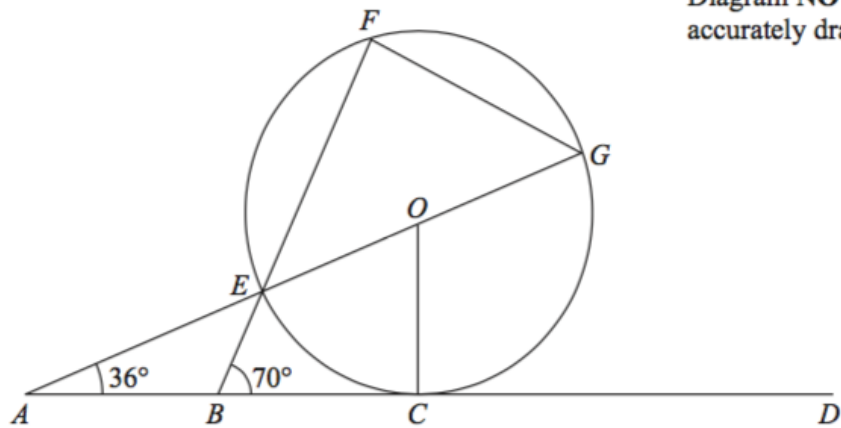


Diagram NOT
accurately drawn

$ABCD$ is the tangent at C to a circle, centre O .

E , F and G are points on the circle.

$AEOG$ and BEF are straight lines.

Angle $BAE = 36^\circ$.

Angle $EBC = 70^\circ$.

Find the size of angle AOC .

$$\angle ACO = 90^\circ \quad (M1)$$

$$180 - 90 - 36 =$$

$$(M1)$$

$$54^\circ$$

(3 marks)

In the diagram below, straight line SRT is the tangent to the circle at the point R.

The triangle UVR is isosceles, with $UV = RV$.

Angle $UVR = 38^\circ$.

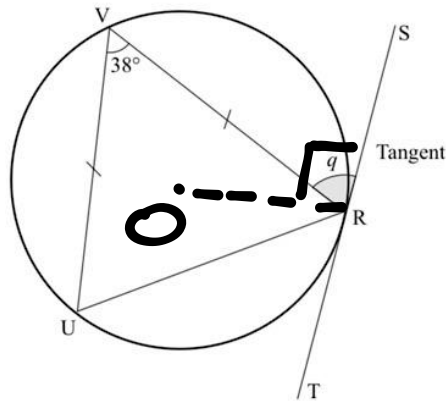


Diagram is
NOT to scale

Calculate the size, q , of angle VRS .

$$\angle VRU =$$

$$\frac{180 - 38}{2} = 71^\circ$$

M_1

$$\angle ORU = \frac{180 - 76}{2} = 52^\circ$$

M_1

$$\angle VRO = 71 - 52 = 19$$

$$q = \angle VRS = 90 - 19 =$$

A_1

$$71^\circ$$

(3 marks)

In the diagram below, P and Q are points on a circle with centre O .

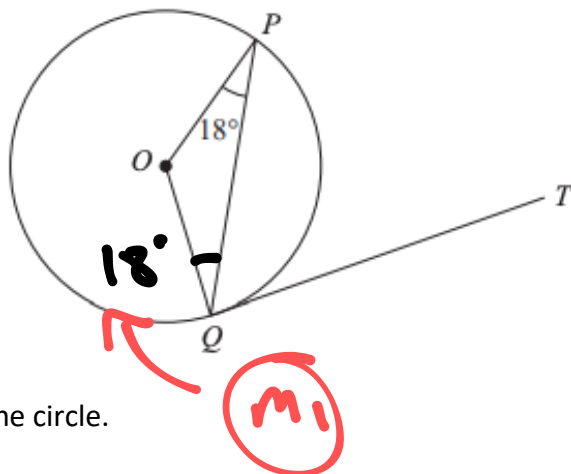


Diagram **NOT**
accurately drawn

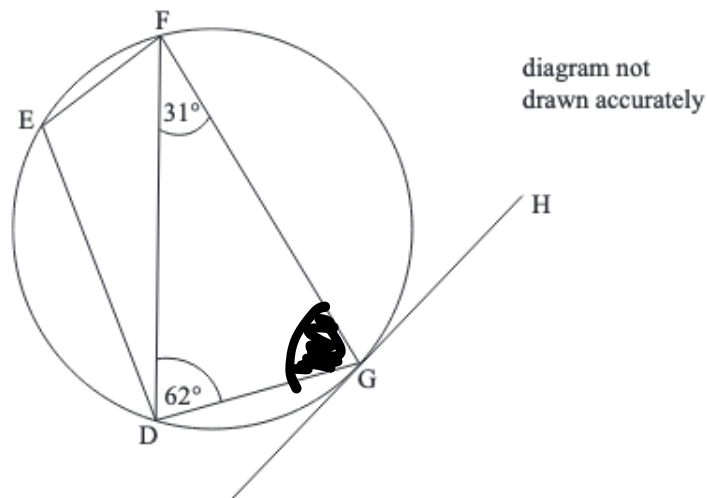
QT is a tangent to the circle.
Angle $OPQ = 18^\circ$

Work out the size of angle PQT .

$$\begin{aligned} \angle PQT &= 90 - 18 \quad (m_1) \\ &= 72^\circ \quad (A_1) \end{aligned}$$

.....
(3 marks)

D, E, F and G are points on the circumference of the circle below.
 The angle FDG = 62° and the angle DFG = 31°
 HG is a tangent to the circle.



Calculate the size of angle DEF.

$$\angle DGF = 180 - 62 - 31 = 87^\circ$$

$$\angle DEF = 180 - 87 =$$

$$\underline{93^\circ}$$

.....
 (3 marks)

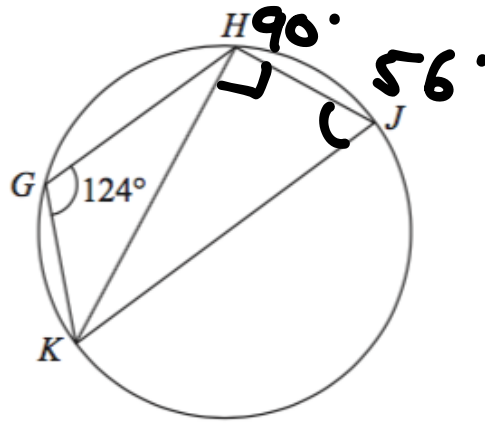


Diagram NOT
accurately drawn

G, H, J and K are points on a circle.
KJ is a diameter of the circle.
Angle KGH = 124°.

Work out the size of angle HKJ.

$$\angle HJK = 180 - 124 = 56^\circ$$

$$\angle HKJ = 90^\circ$$

$$\angle HKJ = 180 - 90 - 56 =$$

$$\underline{34^\circ}$$

(3 marks)

Calculate the size of angle x in the diagram below.

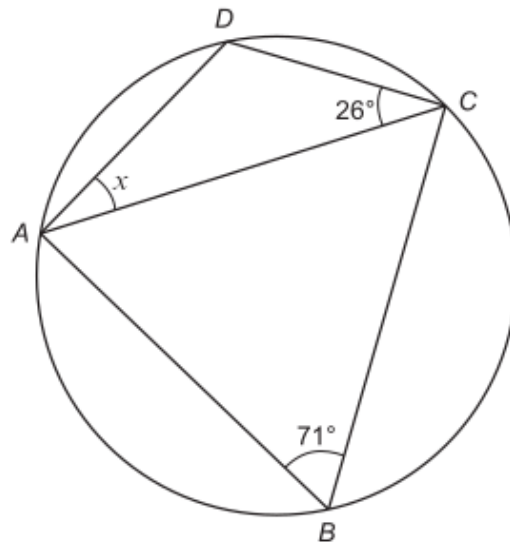


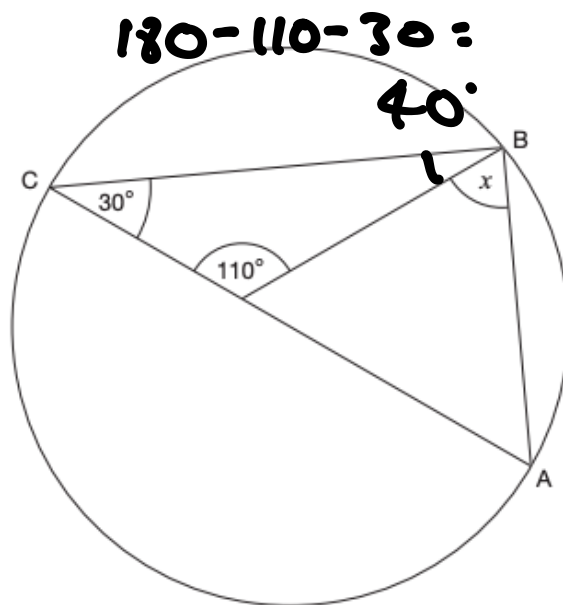
Diagram not drawn to scale

$$\angle ADC = 109^\circ \quad (M_1)$$

$$x = 180 - 26 - 109 = \underline{45^\circ} \quad (M_1) \quad (A_1)$$

.....
(3 marks)

AC is the diameter of a circle and B is a point on the circumference of the circle.



What is the size of angle x ?

$$\angle ABC = 90^\circ \quad (M1)$$

$$90 - 40 = \underline{50} \quad (A1)$$

(M1)

.....
(3 marks)

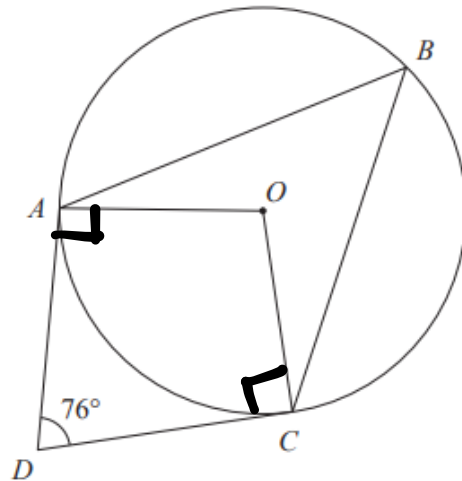


Diagram NOT
accurately drawn

A , B and C are points on a circle, centre O .
 DA and DC are tangents to the circle.
 Angle $ADC = 76^\circ$

Work out the size of angle ABC .

(M1)

$$360 - 90 - 90 - 76 = \underline{104^\circ}$$

$$\frac{104}{2} = 52^\circ$$

(M1)

(A1)

.....
 (3 marks)

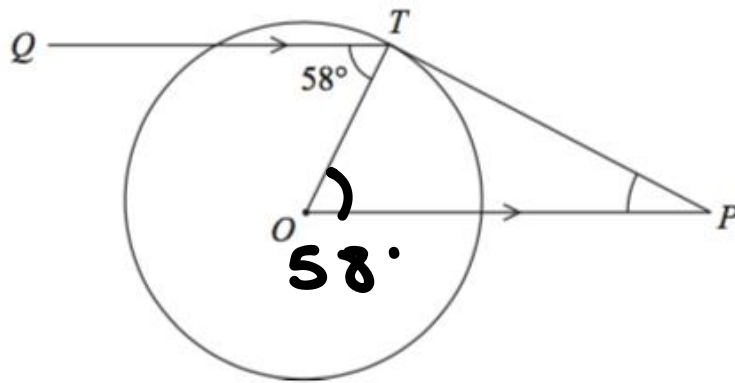


Diagram **NOT**
accurately drawn

T is a point on a circle, centre O .

Q is a point such that angle $QTO = 58^\circ$

P is the point such that OP is parallel to QT and PT is a tangent to the circle.

Work out the size of angle OPT .

$$\angle POT = 58^\circ \quad (M_1)$$

$$\angle OTP = 90^\circ \quad (M_1)$$

$$180 - 58 - 90 = \underline{32} \quad (A_1)$$

.....
(3 marks)

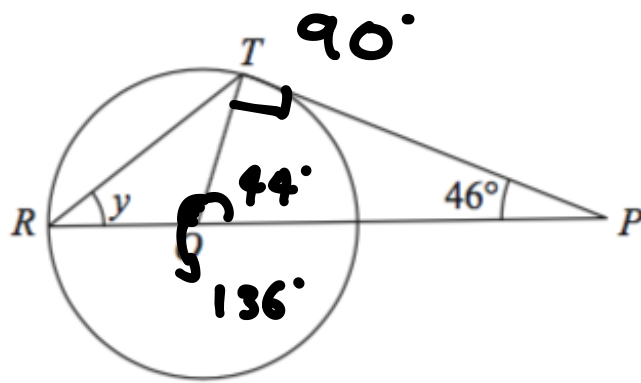


Diagram **NOT**
accurately drawn

R and T are points on a circle, centre O .

ROP is a straight line.

PT is a tangent to the circle.

Angle $TPO = 46^\circ$

Work out the size of angle y .

$$\angle POT = 180 - 90 - 46 = 44 \quad \text{M1}$$

$$y = \frac{44}{2} = \underline{22} \quad \text{A1} \quad \text{M1}$$

.....
(3 marks)