

CIRCLE THEOREMS (HIGHER)

GRADE 6

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.

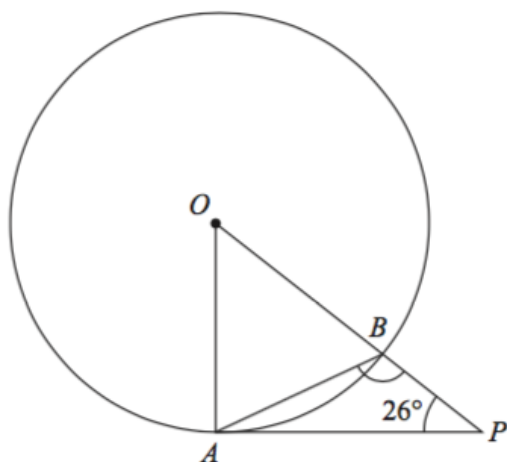


Diagram **NOT**
accurately drawn

A and B are points on a circle, centre O .

PA is the tangent to the circle at A .

OBP is a straight line.

Angle $AP O = 26^\circ$.

Calculate the size of angle ABP .

.....
(3 marks)

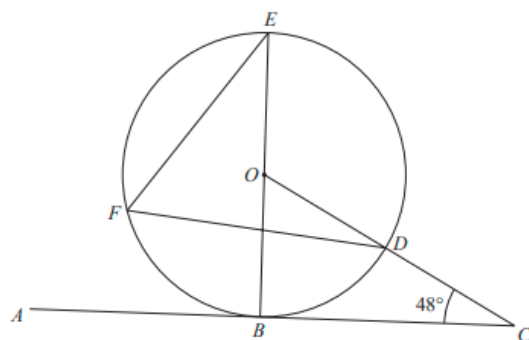


Diagram **NOT**
accurately drawn

B , D , E and F are points on a circle, centre O .

ABC is a tangent to the circle.

ODC is a straight line.

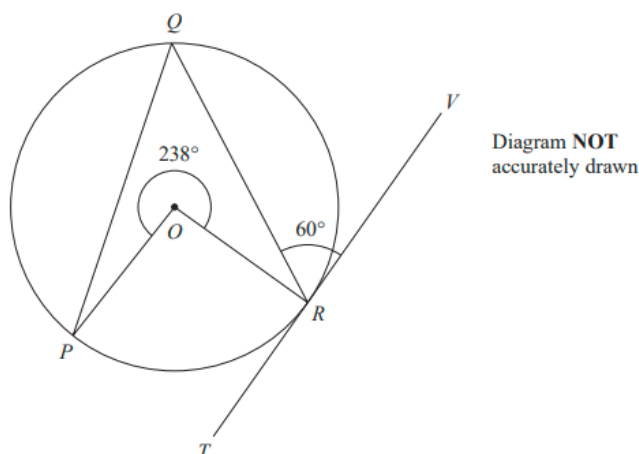
BOE is a diameter of the circle.

Angle $BCD = 48^\circ$

Find the size of angle DFE .

.....
(3 marks)

P , Q and R are points on a circle, centre O . TRV is the tangent to the circle at R .



Reflex angle $POR = 238^\circ$

Angle $QRV = 60^\circ$

Calculate the size of angle OPQ .

Q, R, S and T are points on a circle.
 ATB is the tangent to the circle at T

Angle $STR = 26^\circ$

Angle $RQT = 73^\circ$

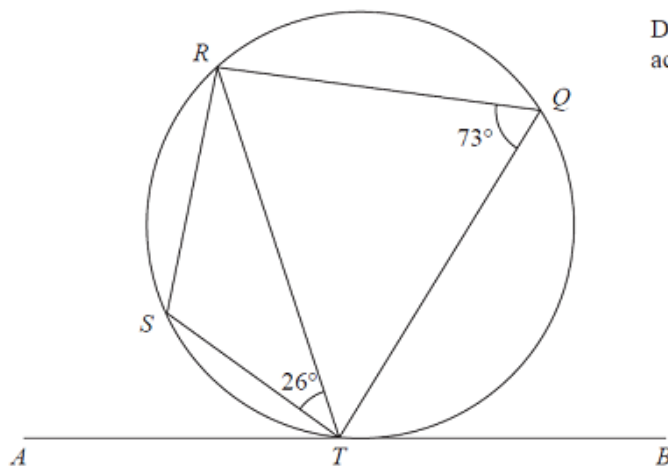


Diagram **NOT**
accurately drawn

Work out the size of angle STA

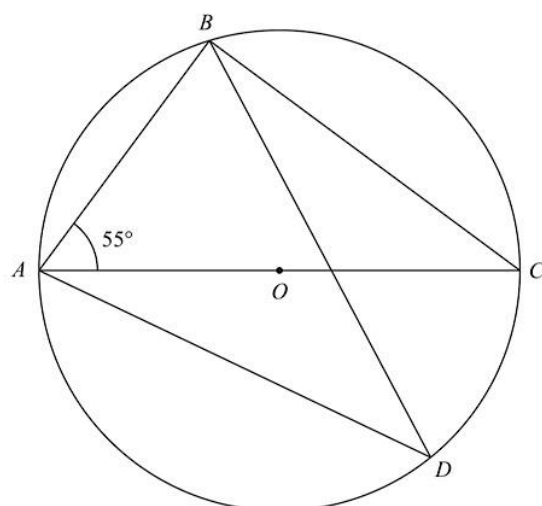


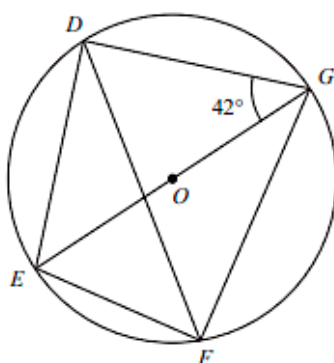
Diagram **NOT**
accurately drawn

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

Angle $BAC = 55^\circ$

Work out the size of angle ADB

D , E , F and G are points on a circle, centre O



EOG is a diameter of the circle.

Angle $EGD = 42^\circ$

Calculate the size of angle DFG

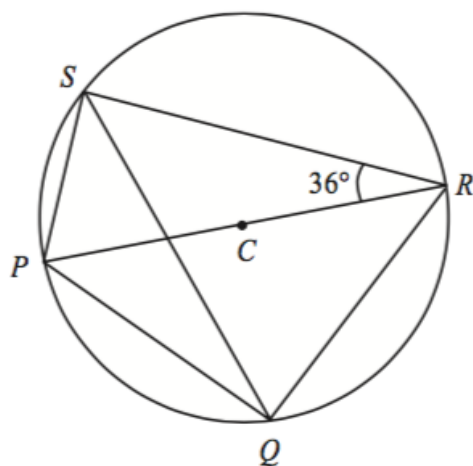


Diagram **NOT**
accurately drawn

P , Q , R and S are points on a circle, centre C .

PCR is a straight line.

Angle $PRS = 36^\circ$.

Calculate the size of angle RQS .

.....
(4 marks)

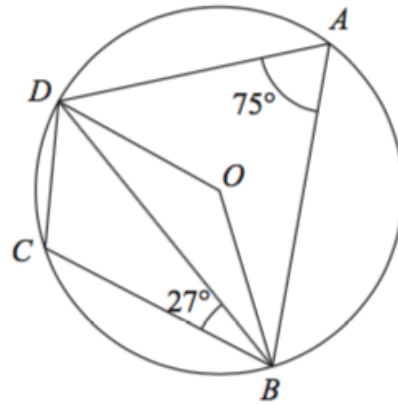


Diagram **NOT**
accurately drawn

A, B, C and D are points on a circle, centre O .

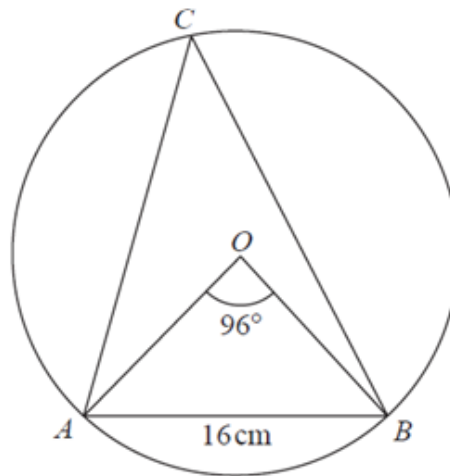
Angle $DAB = 75^\circ$

Angle $DBC = 27^\circ$

Work out the size of angle ODC .

.....
(4 marks)

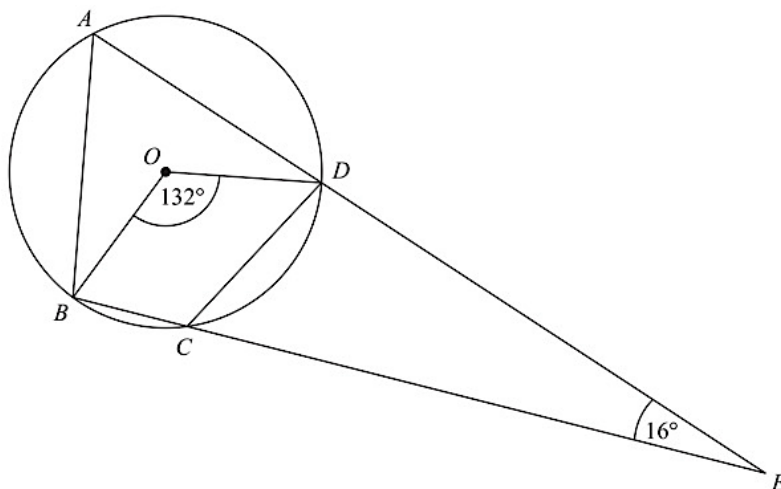
The diagram shows a circle with centre O .
The points A , B and C lie on the circle.



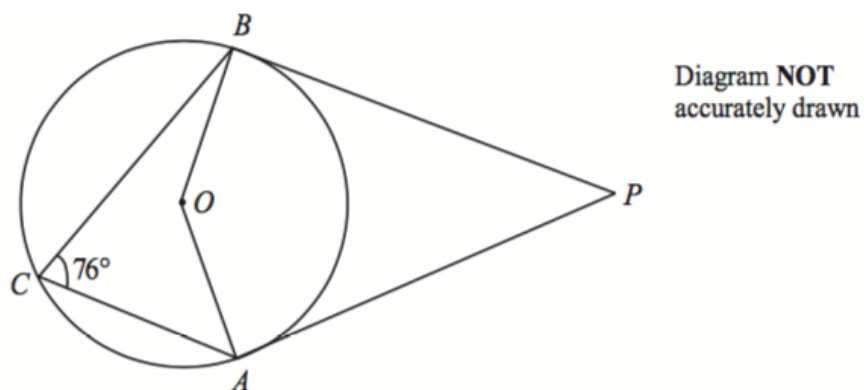
$$AB = 16\text{cm}$$

Work out the radius of the circle.
Give your answer correct to 3 significant figures.

A , B , C and D are points on the circumference of a circle, centre O .
 ADE and BCE are straight lines.



Work out the size of angle CDE .



A , B and C are points on a circle, centre O .

Angle $ACB = 76^\circ$.

PA and PB are tangents to the circle.

Calculate the size of angle APB .

.....
(4 marks)

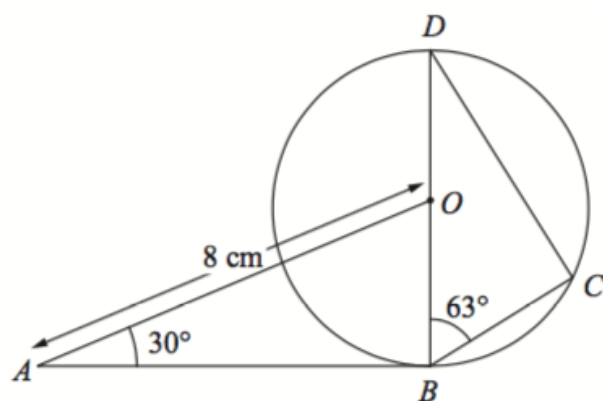


Diagram **NOT**
accurately drawn

B , C and D are points on a circle, centre O .

BOD is a diameter of the circle.

AB is the tangent to the circle at B .

$AO = 8 \text{ cm}$. Angle $BAO = 30^\circ$ Angle $CBD = 63^\circ$

Calculate the length of BC .

Give your answer correct to 3 significant figures.

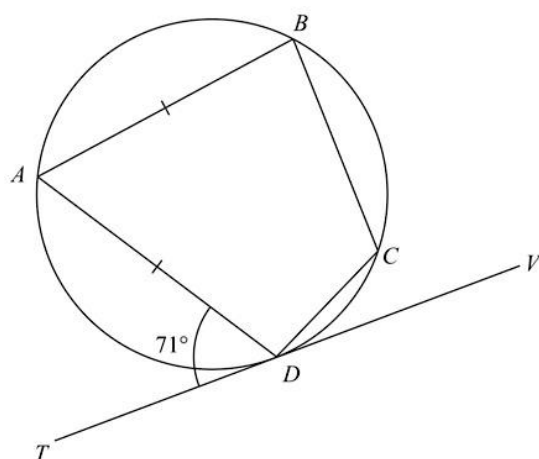


Diagram **NOT**
accurately drawn

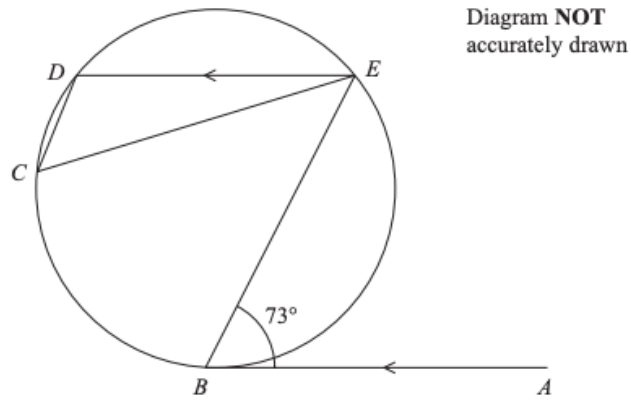
A, B, C and D are points on a circle.
 TDV is the tangent to the circle at D .

$$AB = AD$$

$$\text{Angle } ADT = 71^\circ$$

Work out the size of angle BCD .

.....
(5 marks)



B , C , D and E are points on a circle.

AB is the tangent at B to the circle.

AB is parallel to ED .

Angle $ABE = 73^\circ$

Work out the size of angle DCE .

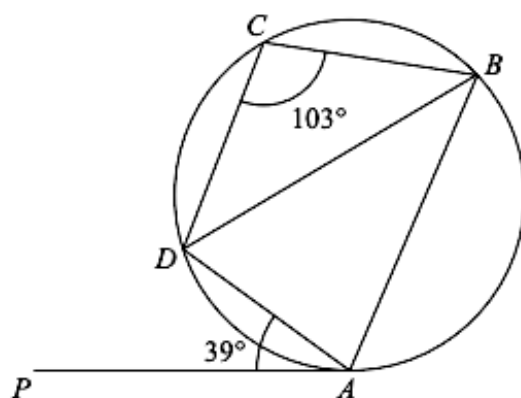


Diagram **NOT**
accurately drawn

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

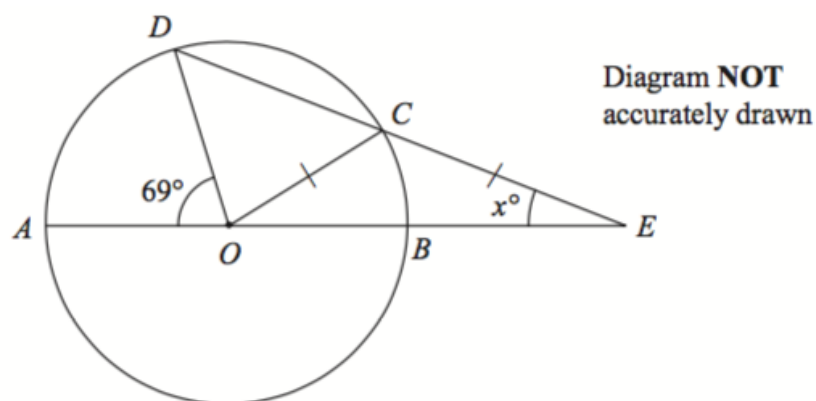
PA is a tangent to the circle.

Angle $PAD = 39^\circ$

Angle $BCD = 103^\circ$

Calculate the size of angle ADB .

.....
(5 marks)



A, B, C and D are points on a circle, centre O .

$AOBE$ and DCE are straight lines.

$CO = CE$.

Angle $AOD = 69^\circ$

Angle $CEO = x^\circ$

Calculate the value of x .

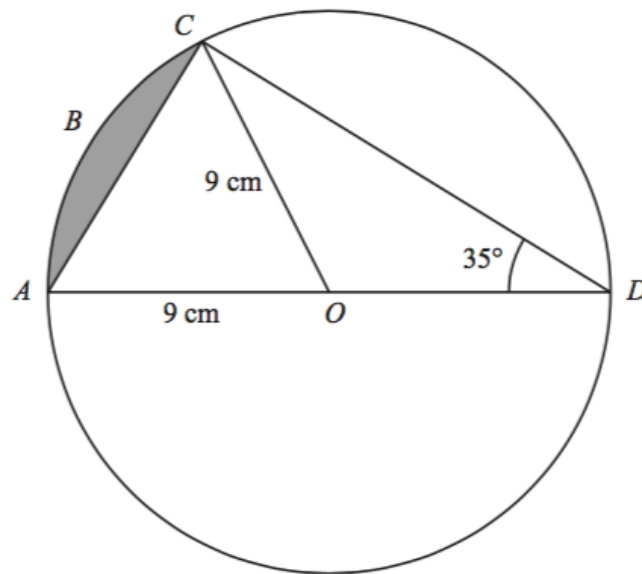


Diagram **NOT**
accurately drawn

AOD is a diameter of a circle, with centre O and radius 9 cm.

ABC is an arc of the circle.

AC is a chord.

Angle ADC = 35°

Calculate the area of the shaded segment.

Give your answer correct to 3 significant figures.

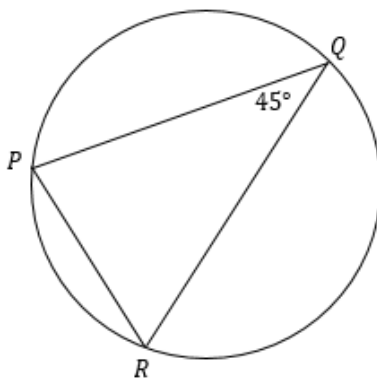
.....
(6 marks)

QUESTIONS FROM MATHEMATICAL COMPETITIONS

Q1.

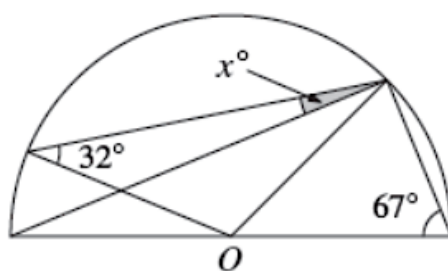
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P , Q and R are points on the circumference of a circle with radius 4cm. $\angle PQR = 45^\circ$. What is the exact length of chord PR ?



$PQRS$ is a quadrilateral inscribed in a circle of which PR is a diameter. The lengths of PQ , QR and RS are 60, 25 and 52 respectively. What is the length of SP ?

The diagram shows a semicircle with centre O .



Two of the angles are given. What is the value of x ?

The radii of two concentric circles are in the ratio 1:3.

AC is a diameter of the larger circle. BC is a chord of the larger circle and is tangent to the smaller circle. AB has length 140.

What is the radius of the larger circle?