Circle Theorems (including Intersecting Chord Theorem) — Shadow Paper

Pearson Edexcel International GCSE (9–1) Mathematics A — Higher Tier · Grade 6

Name: _____ Class: _____ Date: _____

7 questions · 24 marks · approx. 24 minutes

Q1. **Objective:** Use the intersecting chord theorem to find the length of an unknown part of a chord. **[2 marks]**

Source: Original question in the style of Edexcel 4MB1 (shadow of Q1, different values)

A, B, C and D are four points on a circle.
The chord AC intersects the chord BD at P.
AP = 8 cm, BP = 12 cm, PD = 6 cm.

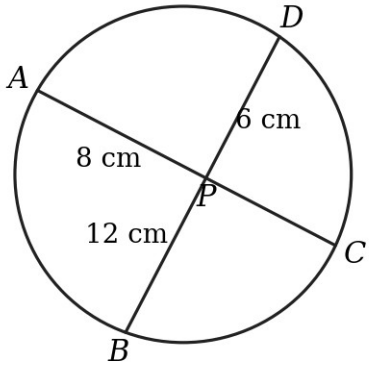


Diagram **NOT** accurately drawn

Calculate the length, in cm, of PC.

Answer: ..... cm [2 marks]

Q2. **Objective:** Combine the tangent-radius perpendicular property with angle facts around a point and in a triangle to find an unknown angle. **[3 marks]**

Source: Original question in the style of Edexcel 4MA1 (shadow of Q2, different values)

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 = 36°.

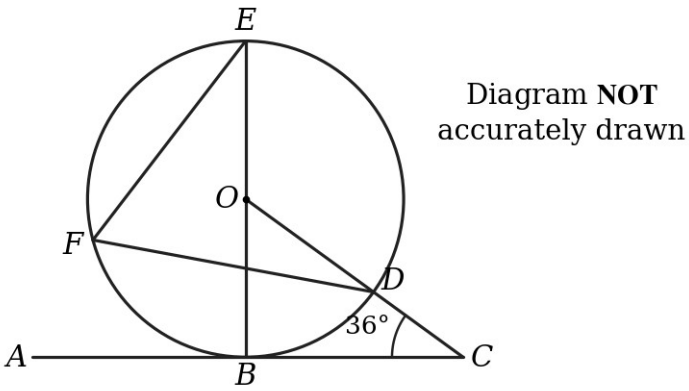


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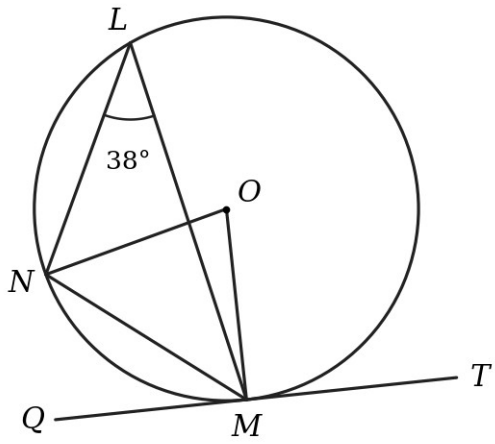
Find the size of angle DFE.

Answer: ..... ° [3 marks]

Q3. **Objective:** Use the angle-at-the-centre theorem and the alternate segment theorem to find two unknown angles, giving a reason for each answer. **[4 marks]**

Source: Original question in the style of Edexcel 4MA1 (shadow of Q3, different values)

L, M and N are points on a circle, centre O.
QMT is the tangent to the circle at M.
Angle NLM = 38°.



(a) (i) Find the size of angle NOM.

..... °

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

(b) (i) Find the size of angle NMQ.

..... °

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

Q4. **Objective:** Use the alternate segment theorem (or the tangent-radius property) and an isosceles triangle to find an angle in a circle. **[2 marks]**

Source: Original question in the style of Edexcel 4MA1 (shadow of Q4, different values)

A, B and C are points on a circle.
MN is the tangent to the circle at C.
AB = CB
Angle BCN = 71°

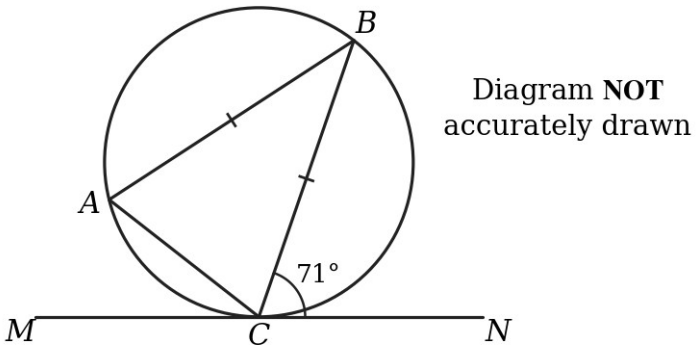


Diagram **NOT** accurately drawn

Find the size of angle ABC.

Answer: ..... ° [2 marks]

Q5. **Objective:** Use the tangent-radius perpendicular property together with angles at a point and angle facts in a triangle to find an unknown angle, giving a reason for each stage of the working. **[4 marks]**

Source: Original question in the style of Edexcel 4MA1 (shadow of Q5, different values)

P, Q and R are points on a circle, centre O.
TRV is the tangent to the circle at R.
Reflex angle POR = 250°.
Angle QRV = 55°.

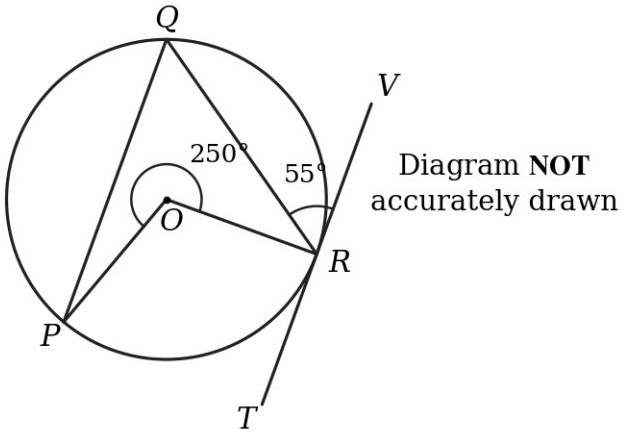


Diagram **NOT** accurately drawn

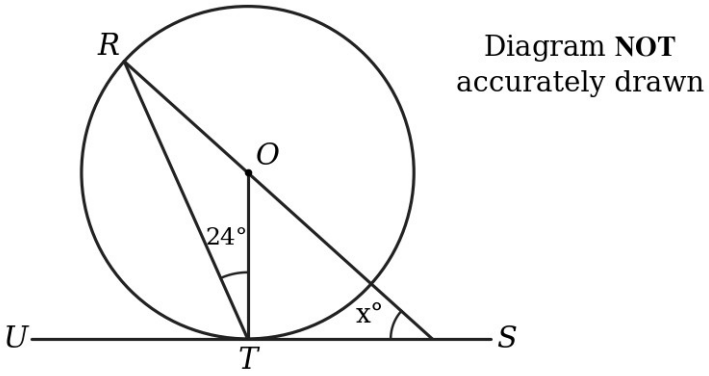
Calculate the size of angle OPQ.
Give a reason for each stage of your working.

Answer: ..... ° [4 marks]

Q6. **Objective:** Use the tangent-radius perpendicular property together with angle facts in a triangle to find an unknown angle, giving a reason for each stage of the working. **[4 marks]**

Source: Original question in the style of Edexcel 4MB1 (shadow of Q6, different values)

R and T are two points on a circle, centre O.
STU is the tangent to the circle at the point T.
ROS is a straight line.
Angle OTR = 24°.



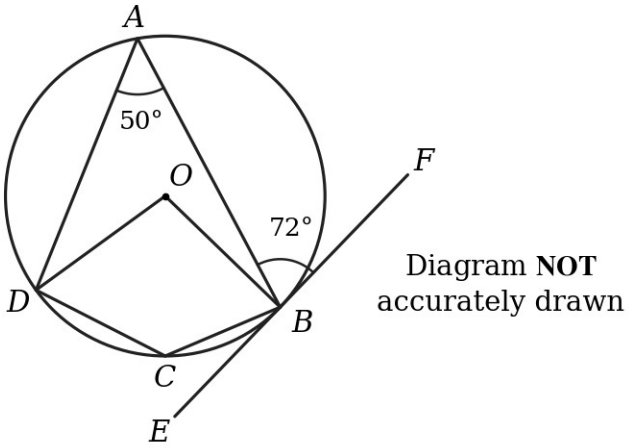
Calculate the value of x.
Give reasons for each stage of your working.

Answer: ..... ° [4 marks]

Q7. **Objective:** Use circle theorems — opposite angles of a cyclic quadrilateral and the alternate segment theorem — to find and give a reason for an angle, then combine further angle facts to find a second unknown angle. **[5 marks]**

Source: Original question in the style of Edexcel 4MA1 (shadow of Q7, different values)

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



(a) (i) Work out the size of angle DCB.

..... °

(1)

(ii) Give a reason for your answer to (a)(i).

.....

.....

(1)

(b) Work out the size of angle ADO.

Answer: ..... ° [3 marks]