Paper Reference(s)

1380/4H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 4 (Calculator)

Circle Theorems

Past Paper Questions

Arranged by Topic

Materials required for examination	**Items included with question papers**
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
You must NOT write on the formulae page.
Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 26 questions in this question paper. The total mark for this paper is 100.
There are 24 pages in this question paper. Any blank pages are indicated.
Calculators may be used.
If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

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Turn over

edexcel
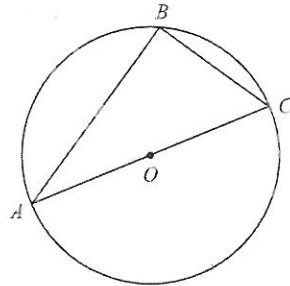advancing learning, changing lives

1.

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.

(a) (i) Write down the size of angle *ABC*.

$90°$ °

(ii) Give a reason for your answer.
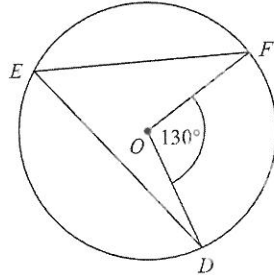
The inscribed angle is ½ the intercepted arc.

(2)

Diagram **NOT** accurately drawn

D, *E* and *F* are points on the circumference of a circle, centre *O*.
Angle *DOF* = 130°.

(b) (i) Work out the size of angle *DEF*.

$m \angle DEF = \frac{1}{2}(130°) = 65°$ °

(ii) Give a reason for your answer.

Inscribed angle is ½ intercepted arc. The arc is equal to the central angle.
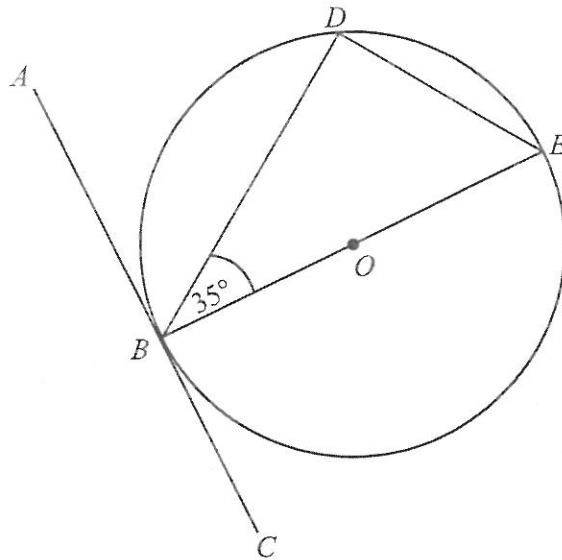
(2)

(Total 4 marks)

Q1

2.

Diagram **NOT**
accurately drawn

B, D and E are points on a circle centre O.
ABC is a tangent to the circle.
BE is a diameter of the circle.
Angle $DBE = 35°$.

(a) Find the size of angle ABD.
     Give a reason for your answer.

$\angle ABD = 90° - 35 = 55°$

$\angle ABE$ is $90°$ because a tangent
line formed a right angle with
the diameter.

..........55°.......... °

(2)

(b) Find the size of angle DEB.
     Give a reason for your answer.

$\angle DEB = 90° - 35° = 55°$

.... °
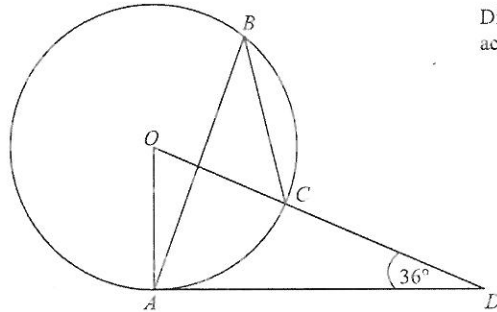
(2)   Q2

(Total 4 marks)

3.

Diagram **NOT** accurately drawn

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

DCO is a straight line.
DA is a tangent to the circle.

Angle $ADO = 36°$

(a) Work out the size of angle AOD.

$$m\angle AOD = 90° - 36 = 54°$$

54°   °

(2)

(b) (i) Work out the size of angle ABC.

$$m\angle ABC = \frac{1}{2}(54°) = 27°$$

27°   °

(ii) Give a reason for your answer.

$\overset{\frown}{AC}$ is equal to $\angle AOD$

$m\angle ABC = \frac{1}{2}$ of $\overset{\frown}{AC}$
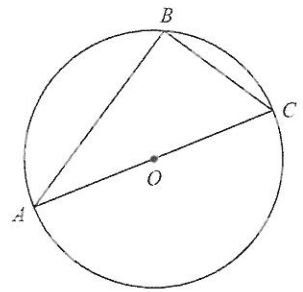
(3)   Q3

(Total 5 marks)

4.

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.

(a) (i) Write down the size of angle *ABC*.

$\angle ABC = 90°$

90° °

(ii) Give a reason for your answer.

$\angle ABC$ is inscribed angle =
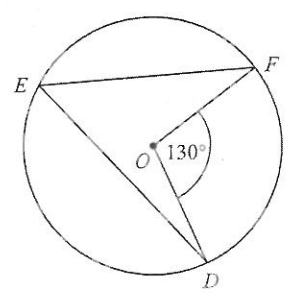½ the intercapted arc

(2)

Diagram **NOT** accurately drawn

D, *E* and *F* are points on the circumference of a circle, centre *O*.
Angle *DOF* = 130°.

(b) (i) Work out the size of angle *DEF*.

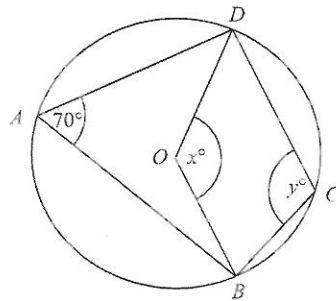$\angle DEF = 65°$

65° °

(ii) Give a reason for your answer.

$\overarc{DF} = $ to the central angle (130°)
incribed ∠ DEF = ½ arc

(2)

Q4

(Total 4 marks)

5.

Diagram **NOT** accurately drawn

In the diagram, A, B, C and D are points on the circumference of a circle, centre O.
Angle $BAD = 70°$.
Angle $BOD = x°$.
Angle $BCD = y°$.

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

$\overset{\frown}{BCD} = \angle x$

$\angle DAB = \frac{1}{2} \overset{\frown}{BCD}$

$\overset{\frown}{BCD} = 2(\angle DAB) = 2(70)$

$x = \underline{\quad 140° \quad}$

(ii) Give a reason for your answer.

$\underline{ARC}$ is twice the inscribed angle.

(2)

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

$y = \frac{1}{2} \overset{\frown}{DAB}$

$\overset{\frown}{DAB} = 360° - 140 = 220°$

$y = \underline{\quad 110° \quad}$

(ii) Give a reason for your answer.

arc $\overset{\frown}{DCB} + \overset{\frown}{DAB} = 360°$

$\overset{\frown}{DCB}$ in (a) $= 140°$
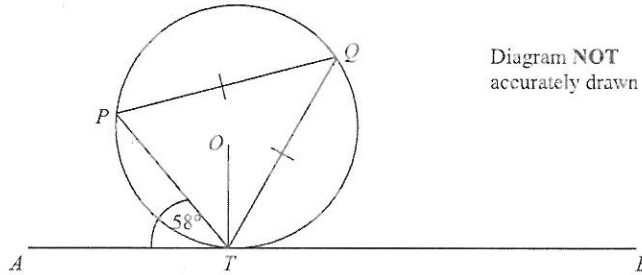
(2)

Q5

(Total 4 marks)

6.

Diagram **NOT**
accurately drawn

P, Q and T are points on the circumference of a circle, centre O.
The line ATB is the tangent at T to the circle.

$PQ = TQ$.
Angle $ATP = 58°$.

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

$\angle ATP = 58$

$\overset{\frown}{PT} = 58°$

$\angle PQT = 26°$

$\angle PTQ = \dfrac{180 - 26}{2} = \dfrac{154}{2} = 77°$

$\angle PTO = 90 - 58 = 32°$

$\therefore \angle OTQ = 77° - 32° = 45°$

...............$45°$...............
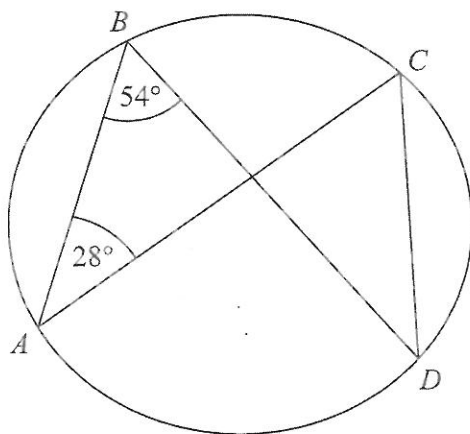
(Total 5 marks)

7.

Diagram **NOT**
accurately drawn

A, B, C and D are points on the circumference of a circle.
Angle $ABD = 54°$.
Angle $BAC = 28°$.

(i) Find the size of angle ACD.

$$\widehat{AD} = 2(54°) = 108°$$
$$\angle ACD = \tfrac{1}{2}\widehat{AD} = 54°$$

.... °

(ii) Give a reason for your answer.

...$\angle ABD$ intercepts arc $\widehat{AD}$...

...$\angle ACD$ intercepts arc $\widehat{AD}$...

$\angle ABD = \angle ACD = 54°$

(Total 2 marks)

Q7