1)
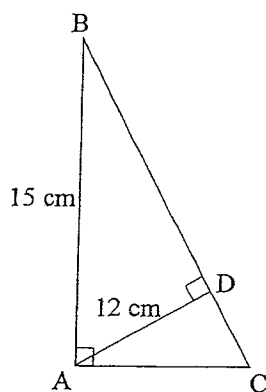

PN is a diagonal of the rectangle MNOP. R is the point on PO and $\angle PQR = 90°$.

i.   Prove that $\triangle PQR$ is similar to $\triangle NMP$.

ii.   Given MP = 5 cm, MN = 10 cm and QR = 2 cm, find the length of PQ.

2)

$\triangle ABC$ is right-angled at A and AD is drawn perpendicular to BC. AB = 15 cm and AD = 12 cm. Copy the given diagram onto your answer sheet.
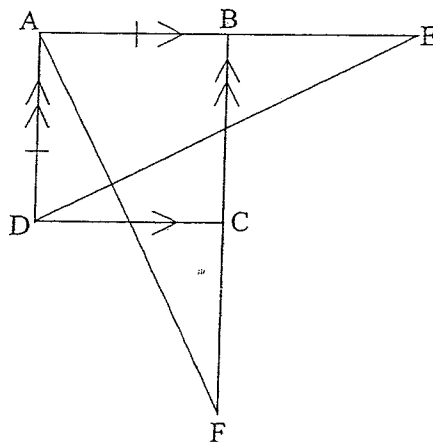

NOT TO SCALE

i.   Show that BD = 9 cm.
ii.   Prove that $\triangle ABC$ is similar to $\triangle DBA$.
iii.   Hence find the length of AC.

3)

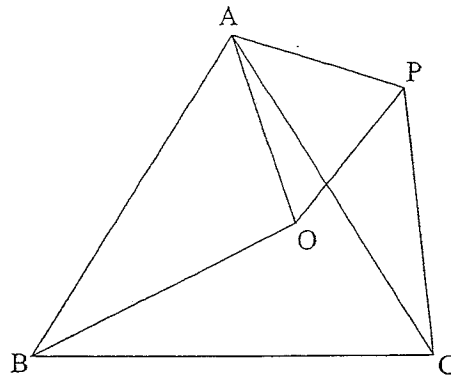In the diagram ABCD is a square. AB is produced to E so that AB = BE and BC is produced to F so that BC = CF.

NOT TO SCALE

i.   Copy the diagram.
ii.   Prove $\triangle AED \equiv \triangle BFA$.
iii.   Hence prove $\angle AED = \angle BFA$.

4)

In the figure triangles ACB and APO are equilateral.

NOT TO SCALE

i.   Copy this diagram and include all the given information.
ii.   Explain why $\angle BAO = \angle PAC$.
iii.   Prove $\triangle AOB \equiv \triangle APC$.
iv.   Hence prove $OB = CP$.

5)

In the diagram CT bisects $\angle ACB$, AE is perpendicular to CT and M is the midpoint of AB. AE produced meets BC at the point P.
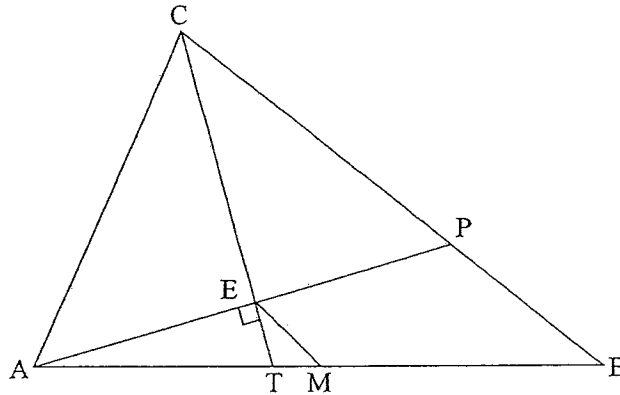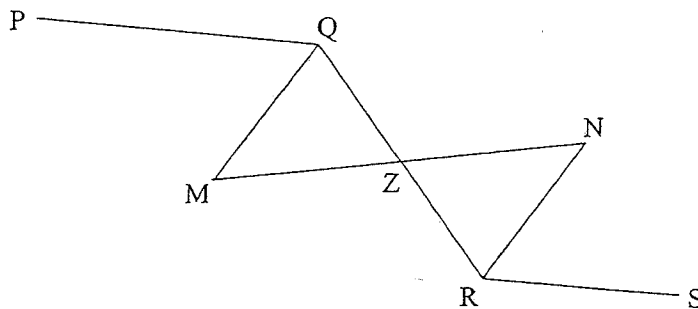

FIGURE NOT TO SCALE

i.   Copy this diagram and mark in all the given information.
ii.   Prove that $\triangle ACE$ is congruent to $\triangle PCE$.
iii.   Explain why $AE = EP$.
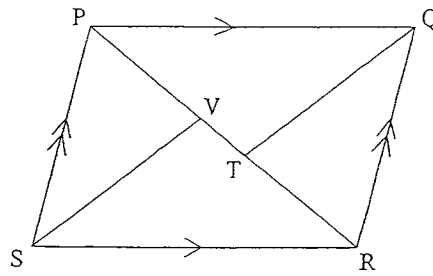iv.   Hence prove that EM is parallel to PB.

6)

In the given diagram PQ ∥ RS. MQ bisects $\angle PQR$, NR bisects $\angle QRS$ and MQ = NR.

i.   Copy this diagram and mark on it all the given information.
ii.   Explain how you know that $\angle MQZ = \angle NRZ$.
iii.   Prove that $\triangle QMZ \equiv \triangle RNZ$.
iv.   Hence prove that the intervals QR and MN bisect each other.

7)

P $\xrightarrow{\hspace{1cm}}$ Q

V

T

S $\xrightarrow{\hspace{1cm}}$ R
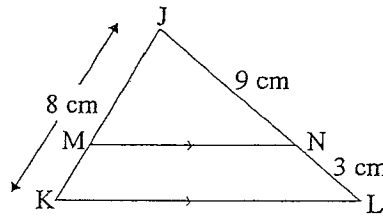
NOT TO SCALE

PQRS is a parallelogram. TQ bisects $\angle$PQR and VS bisects $\angle$PSR.
i.   Copy this diagram
ii.   State why $\angle$PQR = $\angle$PSR.
iii.   Prove that ΔPVS and ΔRTQ are congruent.
iv.   Hence find the length of TV if PR = 20 cm and TR = 8 cm.

8)

J

8 cm   9 cm

M   N

3 cm

K   L
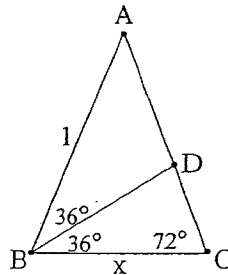
NOT TO SCALE

The diagram shows a triangle JKL. MN $\parallel$ KL, JK = 8 cm, JN = 9 cm, and NL = 3 cm.

i.   Prove that ΔJMN is similar to ΔJKL.
ii.   Find the length of MK.¤

9)

A

1

D

36°
36°   72°
B   x   C
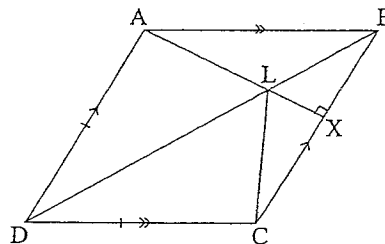
In the diagram ABC is an isosceles triangle where $\angle$ABC = $\angle$BCA = 72° and AB = AC = 1. Angle ABC is bisected by BD, and BC = x.

i.   Copy the diagram.
ii.   Show that triangles ABC and BCD are similar.
iii.   By using (ii) find the exact value of x.¤
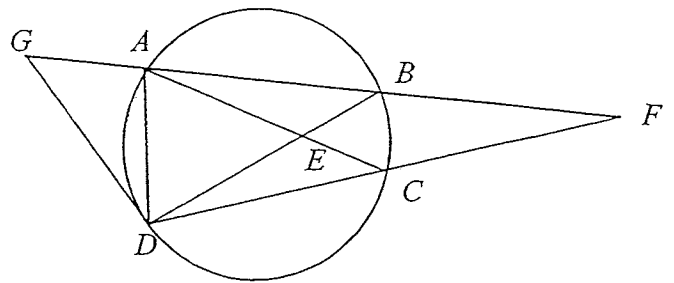
10)

A   B

L

X

D   C

(FIGURE NOT TO SCALE)

ABCD is a rhombus, AX is perpendicular to BC and intersects BD at L.

i.   Copy the diagram and state why $\angle$ADB = $\angle$CDB.
ii.   Prove that the triangles ALD and CLD are congruent.
iii.   Show that $\angle$DAL is a right angle.
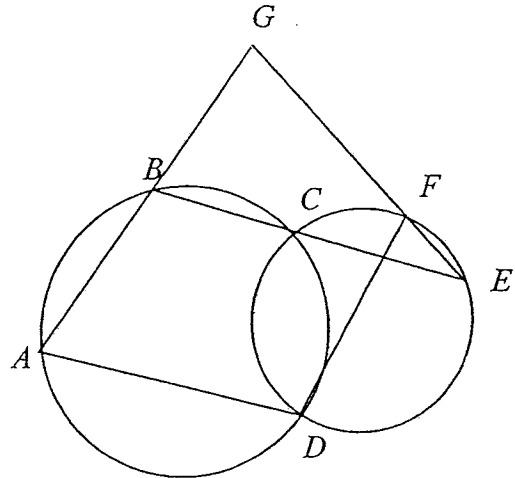iv.   Hence or otherwise find the size of $\angle$LCD.¤

11) In the figure, DG is a tangent to the circle at D.
GABF and DCF are straight lines.
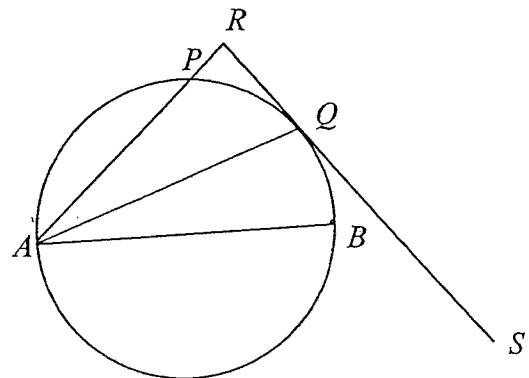
Prove that $2\angle ADG = \angle BEC + \angle BFC$

12) ABG, BCE and EFG are straight lines.

Prove that GFDA is a cyclic quadrilateral.

13) AB is a diameter and AP is a chord . QA is a chord which
bisects $\angle BAP$. The tangent at Q cuts AP produced at R.

Prove that AR is perpendicular to RQ.

14) In the diagram, $\angle DXB = 36°$ and $\angle BDX = 86°$.

Find the size of $\angle YZB$, giving reasons.