1. Loci

1. Using a ruler and a pair of compasses only,
   a. Construct a triangle ABC such that angle ABC = 135°C, AB = 8.2cm and BC = 9.6cm
   b. Given that D is a position equidistant from both AB and BC and also from B and C
   i. Locate D
   ii. Find the area of triangle DBC.

2. (a) Using a ruler, a pair of compasses only construct triangle XYZ such that XY = 6cm, YZ = 8cm and $\angle XYZ = 75^o$
   (b) Measure line XZ and $\angle XZY$
   (c) Draw a circle that passes through X, Y and Z
   (d) A point M moves such that it is always equidistant from Y and Z. construct the locus of M and define the locus

3. (a) (i) Construct a triangle ABC in which AB=6cm, BC = 7cm and angle ABC = 75^o
   Measure:-
   (i) Length of AC
   (ii) Angle ACB
   (b) Locus of P is such that BP = PC. Construct P
   (c) Construct the locus of Q such that Q is on one side of BC, opposite A and angle BQC = 30^o
   (d) (i) Locus of P and locus of Q meet at X. Mark ***x***
   (ii) Construct locus R in which angle BRC 120^o
   (iii) Show the locus S inside triangle ABC such that XS ≥ SR

4 . *Use a ruler and compasses only for all constructions in this question.*
   a) i) Construct a triangle ABC in which AB=8cm, and BC=7.5cm and $\angle ABC = 112½°$
   ii) Measure the length of AC
   b) By shading the unwanted regions show the locus of P within the triangle ABC such that
   i) AP ≤ BP
   ii) AP >3cm
   Mark the required region as **P**
   c) Construct a normal from C to meet AB produced at D
   d) Locate the locus of **R** in the same diagram such that the area of triangle ARB is ¾ the area of the triangle ABC.

5. On a line AB which is 10 cm long and on the same side of the line, use a ruler and a pair of compasses only to construct the following.
   a) Triangle ABC whose area is 20 cm^2 and angle ACB = 90^o
   b) (i) The locus of a point P such that angle APB = 45^o.
   (ii) Locate the position of P such that triangle APB has a maximum area and calculate this area.

6. A garden in the shape of a polygon with vertices A, B, C, D and E. AB = 2.5m, AE = 10m, ED = 5.2M and DC=6.9m. The bearing of **B** from **A** is 030º and **A** is due to east of **E** while **D** is due north of E, angle EDC = 110º,
   a) Using a scale of 1cm to represent 1m construct an accurate plan of the garden
   b) A foundation is to be placed near to CD than CB and no more than 6m from A,
   i) Construct the locus of points equidistant from CB and CD.
   ii) Construct the locus of points 6m from **A**
   c) i) shade and label **R** ,the region within which the foundation could be placed in the garden
   ii) Construct the locus of points in the garden 3.4m from AE.

iii) Is it possible for the foundation to be 3.4m from AE and in the region?

7. a) Using a ruler and compasses **only** construct triangle PQR in which QR= 5cm, PR = 7cm and angle PRQ = 135°

b) Determine < PQR

c) At P drop a perpendicular to meet QR produced at T d) Measure PT

e) Locate a point **A** on **TP** produced such that the area of triangle AQR is equal to one- and – a - half times the area of triangle PQR

f) Complete triangle AQR and measure angle AQR

8. Use ruler and a pair of compasses only in this question.

(a) Construct triangle ABC in which AB = 7 cm, BC = 8 cm and $\angle ABC = 60^0$.

(b) Measure (i) side AC (ii) $\angle$ ACB

(c) Construct a circle passing through the three points A, B and C. Measure the radius of the circle.

(d) Construct Δ PBC such that P is on the same side of BC as point A and $\angle$ PCB = ½ $\angle$ ACB, $\angle$ BPC = $\angle$ BAC measure $\angle$ PBC.

9. Without using a set square or a protractor:-

(a) Construct triangle **ABC** in which **BC** is 6.7cm, angle **ABC** is 60^o and $\angle$**BAC** is 90^o.

(b) Mark point **D** on line **BA** produced such that line **AD** =3.5cm

(c) Construct:-

(i) A circle that touches lines **AC** and **AD**

(ii) A tangent to this circle parallel to line **AD**

. Use a pair of compasses and ruler only in this question;

(a) Draw acute angled triangle **ABC** in which angle **CAB** = 37½ ^{o}, **AB** = 8cm and **CB** = 5.4cm. Measure the length of side **AC** (**hint 37½ ^{o} = ½ x 75^o**)

(b) On the triangle **ABC** below:

(i) On the same side of **AC** as **B,** draw the locus of a point **X** so that angle **Ax C** = 52½ ^{o}

(ii) Also draw the locus of another point **Y**, which is 6.8cm away from **AC** and on the same side as **X**

(c) Show by shading the region **P** outside the triangle such that angle **APC ≥ 52 ½^o** and **P** is not less than 6.8cm away from **AC**