

1. Loci

1. Using a ruler and a pair of compasses only,
 - a. Construct a triangle ABC such that angle $ABC = 135^\circ$, $AB = 8.2\text{cm}$ and $BC = 9.6\text{cm}$
 - 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 $XY = 6\text{cm}$, $YZ = 8\text{cm}$ and $\angle XYZ = 75^\circ$
 - (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 $AB=6\text{cm}$, $BC = 7\text{cm}$ and angle $ABC = 75^\circ$
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 $BQC = 30^\circ$
 - (d) (i) Locus of P and locus of Q meet at X. Mark x
(ii) Construct locus R in which angle $BRC = 120^\circ$
(iii) Show the locus S inside triangle ABC such that $XS \geq SR$
4.

Use a ruler and compasses only for all constructions in this question.

 - a) (i) Construct a triangle ABC in which $AB=8\text{cm}$, and $BC=7.5\text{cm}$ and $\angle ABC=112\frac{1}{2}^\circ$
ii) Measure the length of AC
 - b) By shading the unwanted regions show the locus of P within the triangle ABC such that
 - i) $AP \leq BP$
 - ii) $AP > 3\text{cm}$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 $\frac{3}{4}$ 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 $ACB = 90^\circ$
 - b) (i) The locus of a point P such that angle $APB = 45^\circ$.
(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. $AB = 2.5\text{m}$, $AE = 10\text{m}$, $ED = 5.2\text{m}$ and $DC=6.9\text{m}$. The bearing of **B** from **A** is 030° and **A** is due to east of **E** while **D** is due north of E, angle $EDC = 110^\circ$,
 - 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 \angle 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 $\angle ABC = 60^\circ$.
- (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 $\triangle PBC$ such that P is on the same side of BC as point A and $\angle PCB = \frac{1}{2} \angle ACB$, $\angle BPC = \angle BAC$ 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° and $\angle BAC$ is 90° .
- (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** = $37\frac{1}{2}^\circ$, **AB** = 8cm and **CB** = 5.4cm. Measure the length of side **AC** (hint $37\frac{1}{2}^\circ = \frac{1}{2} \times 75^\circ$)
- (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** = $52\frac{1}{2}^\circ$
 - (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** $\geq 52\frac{1}{2}^\circ$ and **P** is not less than 6.8cm away from **AC**