

LOCI TOPIC

KCSE QUICK REVISION

*Compilation of Possible Questions in Mathematics Likely to be examined in
KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 4.*

MATHEMATICS

SERIES 1

For Marking Schemes

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MWALIMU CONSULTANCY

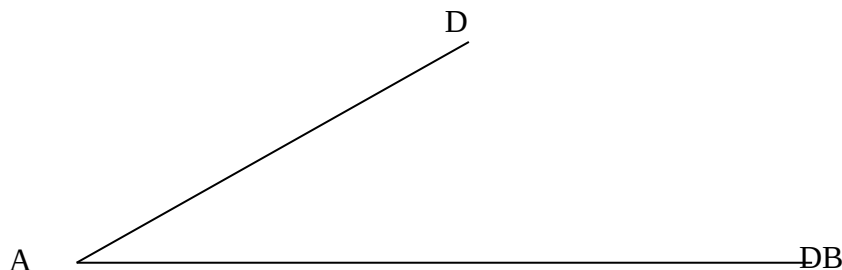
LOCI

1. Using ruler and compasses only, construct a parallelogram ABCD such that $AB = 10\text{cm}$, $BC = 7\text{ cm}$ and $\angle ABC = 105^\circ$. Also construct the loci of P and Q within the parallelogram such that $AP \leq 4\text{ cm}$, and $BC \leq 6\text{ cm}$. Calculate the area within the parallelogram and outside the regions bounded by the loci.

2. Use ruler and compasses only in this question

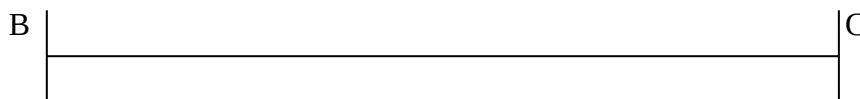
The diagram below shows three points A, B and D

- (a) Construct the angle bisector of acute angle BAD
(b) A point P, on the same side of AB and D, moves in such a way that $\angle APB = 22\frac{1}{2}^\circ$ construct the locus of P
(c) The locus of P meets the angle bisector of $\angle BAD$ at C measure $\angle ABC$



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

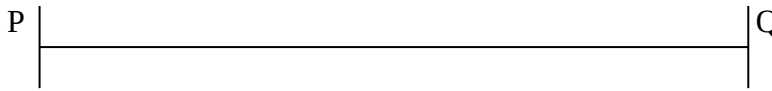
- (a) On the line BC given below, construct triangle $\triangle ABC$ such that $\angle ABC = 30^\circ$ and $BA = 12\text{ cm}$
(b) Construct a perpendicular from A to meet BC produced at D. Measure CD
(c) Construct triangle $A'B'C'$ such that the area of triangle $A'B'C'$ is the three quarters of the area of triangle ABC and on the same side of BC as triangle ABC.
(d) Describe the locus of A'



4. Use a ruler and compasses in this question. Draw a parallelogram ABCD in which $AB = 8\text{ cm}$, $BC = 6\text{ cm}$ and $\angle BAD = 75^\circ$. By construction, determine the perpendicular distance between AB and CD.

5. In this question use a ruler and a pair of compasses.

- a) Line PQ drawn below is part of a triangle PQR. Construct the triangle PQR in which $\angle QPR = 30^\circ$ and line PR = 8 cm
- b) On the same diagram construct triangle PRS such that points S and Q are on the opposite sides of PR $\angle PSR = 90^\circ$ and QS = 8 cm
- c) A point T is on the line passing through R and parallel to QS. If $\angle QTS = 90^\circ$, locate possible positions of T and label them T_1 and T_2 . Measure the length of T_1T_2 .

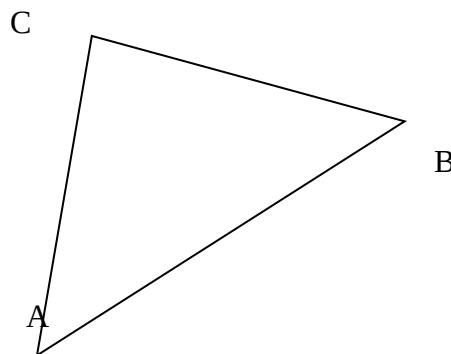


6. (a) ABCD is a rectangle in which AB = 7.6 cm and AD = 5.2 cm. Draw the rectangle and construct the locus of a point P within the rectangle such that P is equidistant from CB and CD (3 marks)

- (b) Q is a variable point within the rectangle ABCD drawn in (a) above such that $60^\circ \leq \angle AQB \leq 90^\circ$

On the same diagram, construct and show the locus of point Q, by leaving unshaded, the region in which point Q lies.

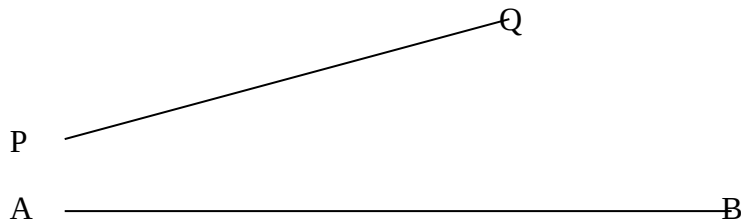
7. The figure below is drawn to scale. It represents a field in the shape of an equilateral triangle of side 80m



The owner wants to plant some flowers in the field. The flowers must be at most, 60m from A and nearer to B than to C. If no flower is to be more than 40m from BC, show by shading, the exact region where the flowers may be planted.

8. In this question use a ruler and a pair of compasses only

In the figure below, AB and PQ are straight lines



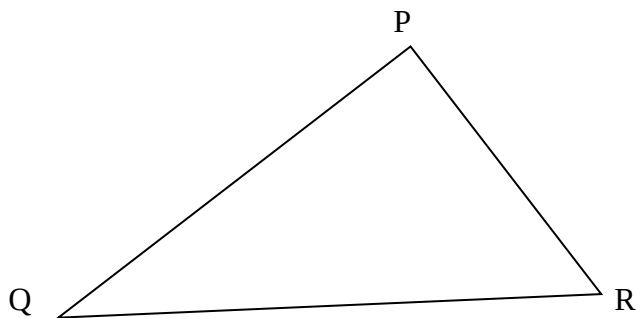
(a) Use the figure to:

- (i) Find a point R on AB such that R is equidistant from P and Q
 - (ii) Complete a polygon PQRST with AB as its line of symmetry and hence measure the distance of R from TS.
- (b) Shade the region within the polygon in which a variable point X must lie given that X satisfies the following conditions
1. X is nearer to PT than to PQ
 2. RX is not more than 4.5 cm
 3. $\angle PXT > 90^\circ$

9. Four points B, C, Q and D lie on same plane. Point B is 42 km due south – west of town Q. Point C is 50 km on a bearing of 560° from Q. Point D is equidistant from B, Q and C.

- (a) Using the scale: 1 cm represents 10 km, construct a diagram showing the position of B, C, Q and D
- (b) Determine the
 - (i) Distance between B and C
 - (ii) Bearing of D from B

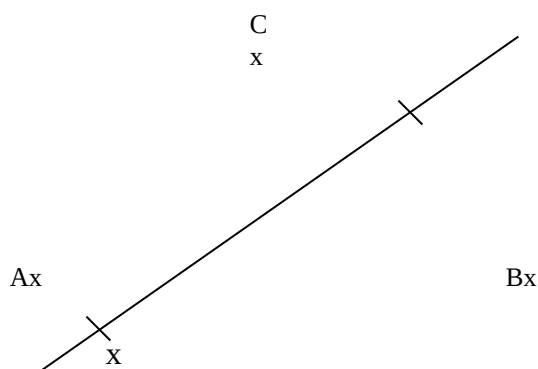
10. The diagram below represents a field PQR



- (a) Draw the locus of point equidistant from sides PQ and PR
- (b) Draw the locus of points equidistant from points P and R
- (c) A coin is lost within a region which is near to point P than R and closer to side PR than to side PQ. Shade the region where the coin can be located.

12. In the figure below, a line XY and three point A,B and C are as given. On the figure construct

- (a) The perpendicular bisector of AB
- (b) A point P on the line XY such that $\angle APB = \angle ACB$



For Marking Schemes/Answers

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