Name..... Adm No: .....

121/1

PRE- MOCK

MATHEMATICS ALT A

PAPER 1

March 2013

2 ½ Hours

Signature: .....

Date: .....

ALLIANCE GIRLS' HIGH SCHOOL – 2013
PRE-MOCK EXAMINATION

Instructions to candidates

1. *Write your name and admission number in the spaces provided above.*
2. *Sign and write the date of examination in the spaces provided above.*
3. *The paper contains two sections: **Section I** and **Section II.***
4. *Answer **All** the questions in **section I** and **strictly any five** questions **from Section II.***
5. *All answers and working must be written on the question paper in the spaces provided below each question.*
6. ***Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.***
7. *Marks may be given for correct working even if the answer is wrong.*
8. *Non-programmable silent electronic calculators and **KNEC** mathematical tables may be used, unless stated otherwise.*
9. ***This paper consists of 19 printed pages .Candidates should check the question paper to Ensure that all the pages are printed as indicated and no questions are missing***

For Examiners use only.

Section I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	To

Section II

17	18	19	20	21	22	23	24	**Total**

Grand Total

1. Use table of logarithms only to evaluate to 4 s.f.

$$\sqrt[5]{\frac{0.0263^2 \times 32.05}{2.374 + \log 342}}$$

(4mks)

2. The sum of interior angles of a triangle is given by the expression $(2a + b)^o$ while that of a quadrilateral is given by $(13a - b)^o$. Calculate the value of a and b. (3mks)

3. Solve for x in

$$\log_4 x(3x^2 - 4) - \log_4(3x - 2) = \log_2(x - 1) \qquad \text{(4mks)}$$

4. Nanjira gave a dozen of her music DVDs to a music store to sell. The production cost of the DVDs is Kshs 4800 and the music store sells them at a profit of 20%. If the store earns a commission of 22½% of the profit, find the amount earned. (2mks)

5. Use tables of reciprocals, tangents and square roots only to solve to 4 s.f. for x in

$$\frac{1}{x} = \frac{4}{\tan 83^o} + \sqrt{0.008576}$$ (4mks)

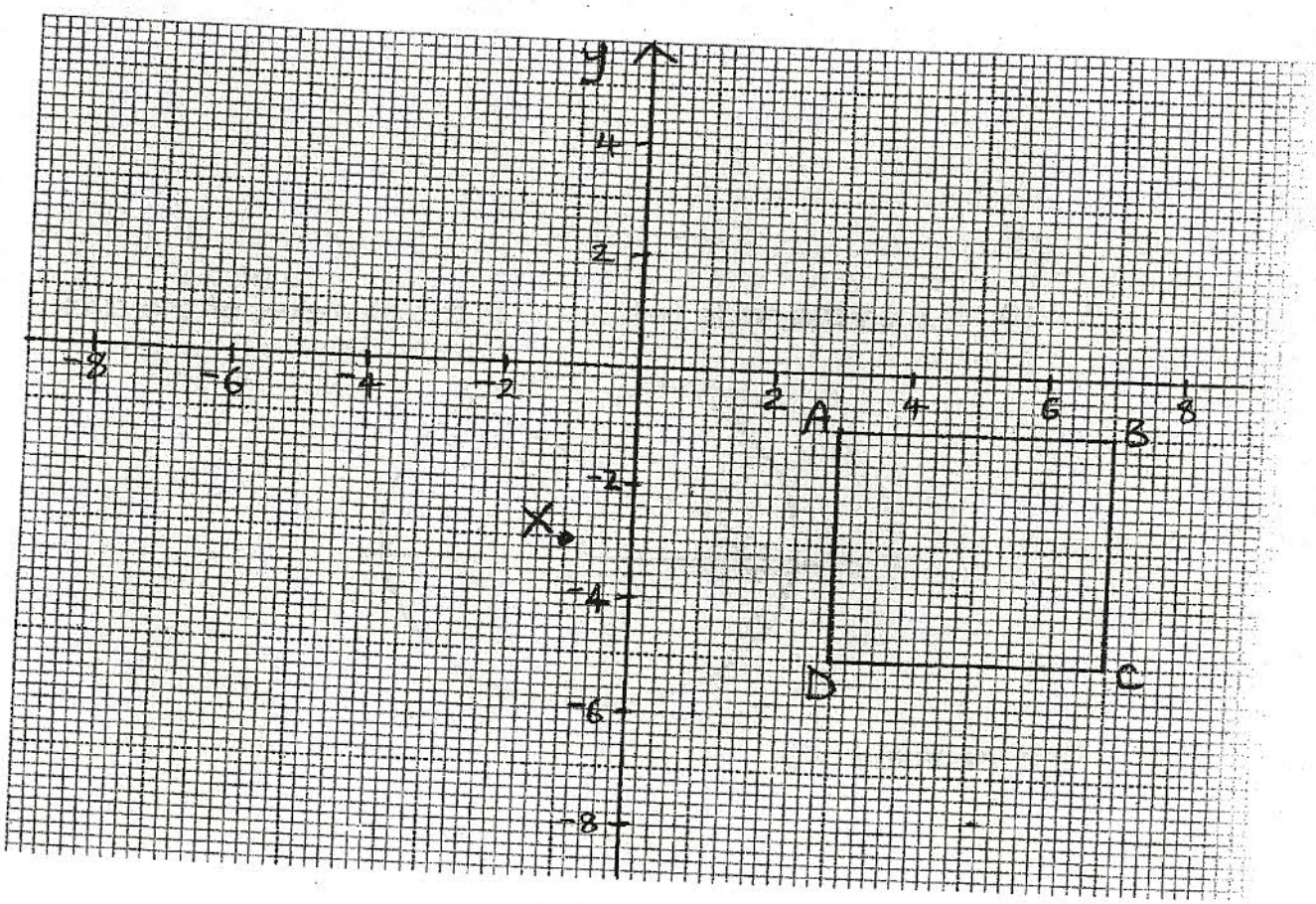
6. A 60m tower in Lumbubashi city is at a point B on the ground. The angle of elevation of the top of the tower from a point A is 50.2^o. B is on a bearing of 290° from A. From another point C the angle of elevation of the tower is 40.6°. C is on a bearing of S15°W from B. Calculate the distance of C from A to 1 d.p. (3mks)

7. Without using a calculator, find

$$\frac{2\frac{1}{4} + \frac{3}{5} \div \frac{5}{6} \text{ of } 2\frac{2}{5}}{1\frac{7}{10}},$$

leaving your answer as a fraction in its simplest form. (3mks)

8.



The square ABCD above is enlarged by scale factor -½ with center of enlargement X

(a) Draw the image A'B'C'D' of the square on the same grid. (2mks)

(b) State the co-ordinates of A'B'C'D' (1mk)

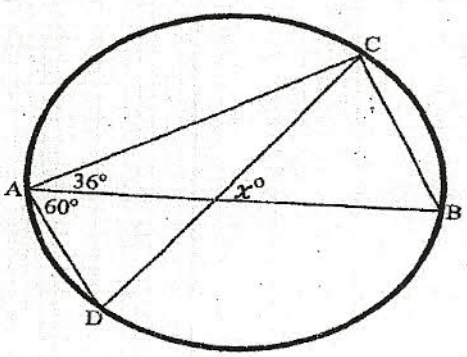
9. The following marks were scored in a mathematics RAT by a group of students in a remedial class

Marks	3 - 5	6 - 8	9 - 11	12 - 14	15 - 17	18 - 20	21 - 23
# of students	3	3	5	6	2	1	3

(a) State the modal class (1mk)

(b) Calculate the median of this data (2mks)

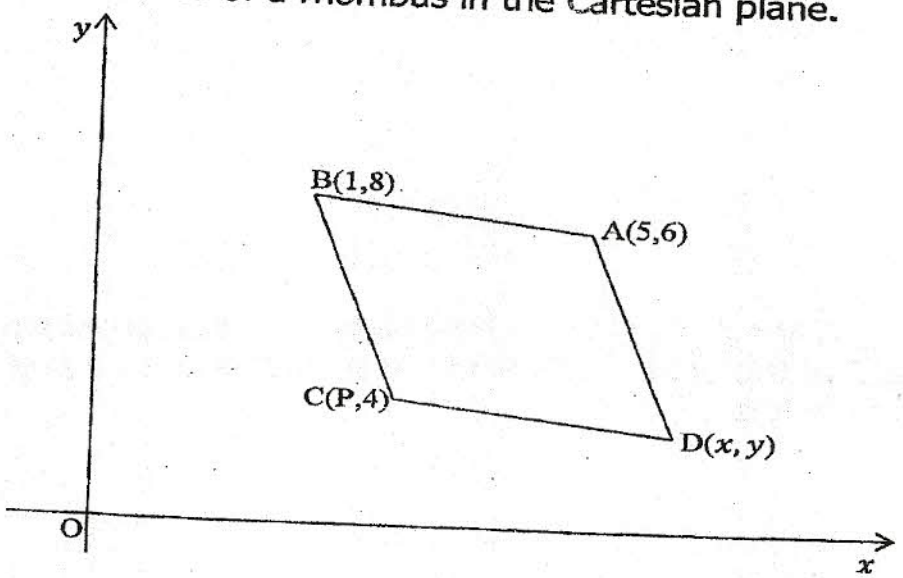
10. In the circle below, AB is the diameter of the circle.



Find the value of x (2mks)

11. Given that the ratio $x:y = 2:3$, find the ratio $(5x - 2y):(x + y)$ (3mks)

12. In the figure below, A(5,6), B(1,8), C(P,4) and D(x, y) are the vertices of a rhombus in the Cartesian plane.

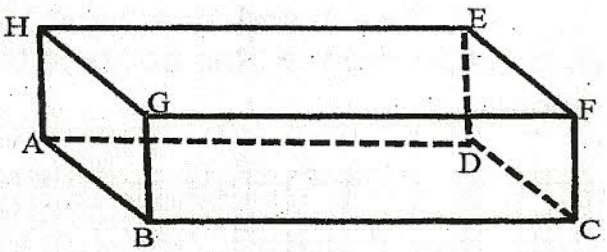


Find P and hence the co-ordinates (x, y) of D (4mks)

13. Five years ago Natasha was four times as old as her daughter. In four years' time, she will be two and a half times as old as her daughter. Find their present ages. (4mks)

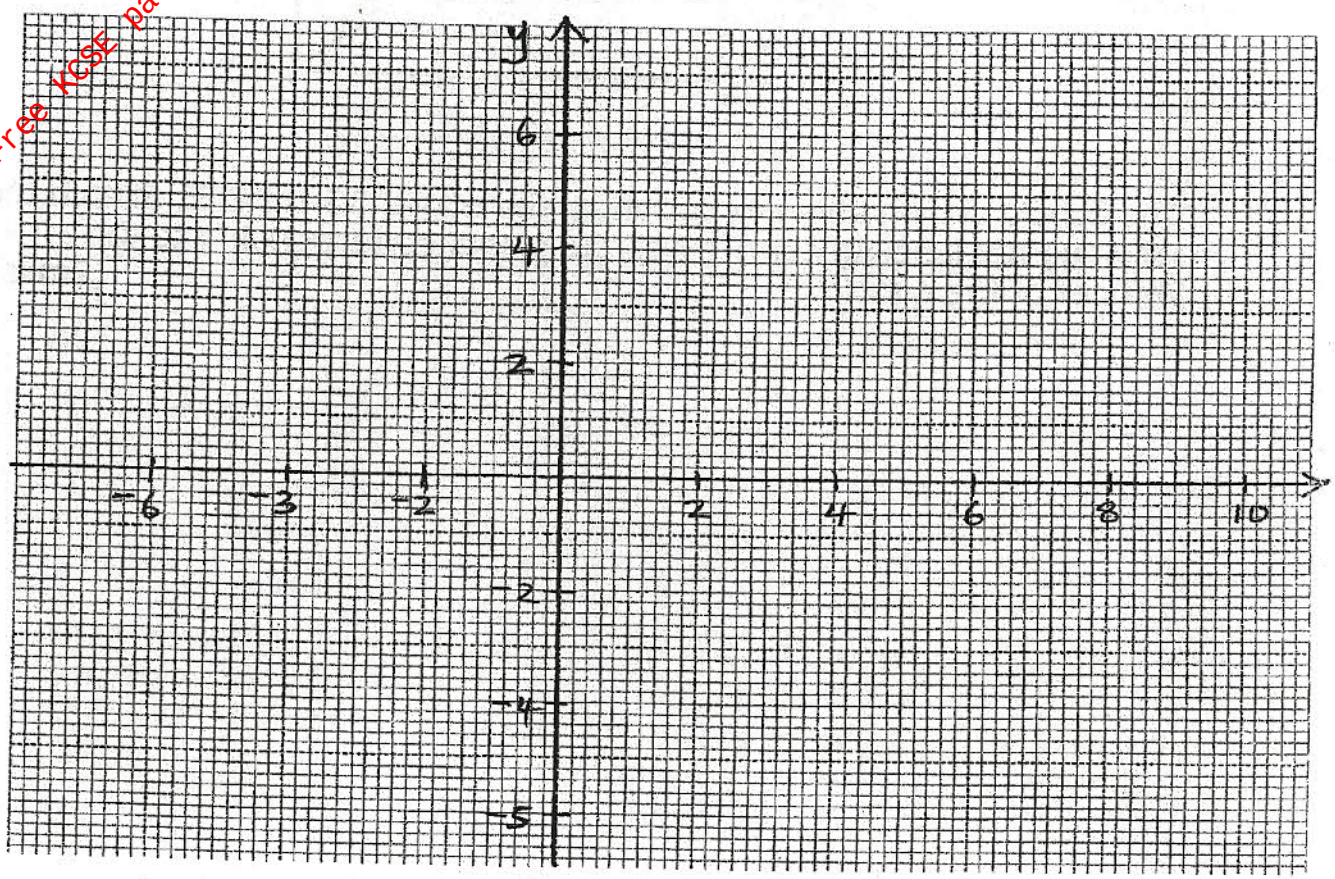
14. A line A, $3y - x = 5$ intersects at a right angle with a second line B at the point (1,2). Find the co-ordinates of a point S where B cuts the line $x = -2$. (3mks)

15.



The cuboid shown above is cut along the edges BGHADCFE. Sketch the resulting net labeling correctly all the points corresponding to the vertices of the cuboid. (2mks)

16. On the grid below draw and label the region R represented by the inequalities $x > 1$, $y \geq 3x - 5$ and $3y + 2x \leq 18$ by shading the unwanted regions. Write down all the points in this region that have integral co-ordinates. (3mks)



17. The distance between two towns A and B is 460km. A mini bus left town A at 8.45am and travelled towards B at an average speed of 65km/h. A car left B at 10.45am on the same day and travelled towards A at an average speed of 100km/h.

a) How far from town B did they meet? (4mks)

b) At what time did the two vehicles meet? (2mks)

c) A motorist started from his home at 9.15am on the same day and travelled to B at an average speed of 120km/hr. He arrived at the same time as the minibus. Calculate the distance from B to his home. (4mks)

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

a) Construct a rectangle ABCD such that AB=6.4cm and the diagonal AC=9cm. (2

b) Construct a line through B parallel to CA. (2

c) Locate a point Y on this line to form a figure AYBC, where $\angle CAY = 60^{o}$ (2

d) Drop a perpendicular from B to meet AC at X.

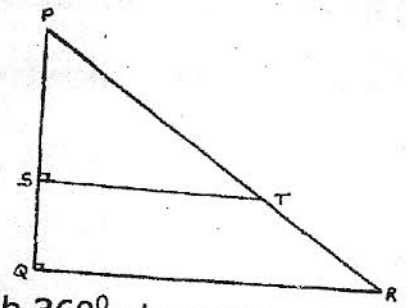
Measure the length:

(i) BX (1

(ii) BY (1

e) Hence calculate the area of the quadrilateral AYBC. (2

19. The figure below shows a triangle in which PQ=18cm. QR=6cm and PS=11cm



If the triangle is rotated through 360^0 about the edge PQ, calculate

(i) The surface area of the cone formed. (3mks)

(ii) The volume of the cone formed (2mks)

(iii) The volume of the frustum formed by the portion QRTS. (3mks)

(iv) The angle at the vertex of the cone. (2mks)

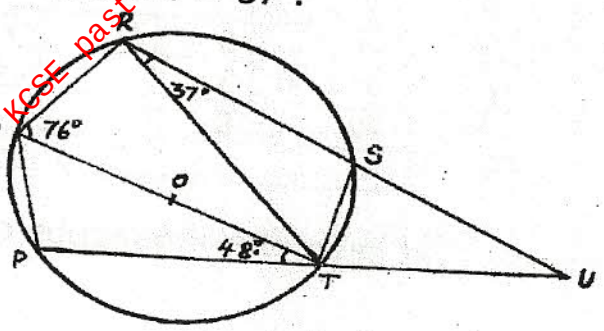
20. The cost of making a table consists of transport, labour and raw material in the ratio 4:2:6 respectively. During an inflation year the transport cost increased by 6%, the labour by 9% and raw materials by 20%.

a) Find the percentage increase in producing a table. (6mks)

b) What was the old price of a table if the new price is Kshs. 680.00? (2mks)

c) How much would Celine have saved if she buys a dozen of tables at the old price? (2mks)

21. In the figure below, QOT is a diameter. Angles QTP=48°, TQR= 76° and SRT = 37°.



Citing reasons, find

a) Angle RST (2mks)

b) Angle SUT (2mks)

c) Angle ROT (2mks)

d) Angle PST (2mks)

e) Angle POS (2mks)

22. a) Complete the table below for the function $y = 3 - 4x - 2x^2$ for $-4 \leq x \leq 2$ (2 mks)

X	-4	-3	-2	-1	0	1	2
3-4x		15	11	7	3		-5
$-2x^2$	-32		-8	-2	0		
y	-13		3			-3	-13

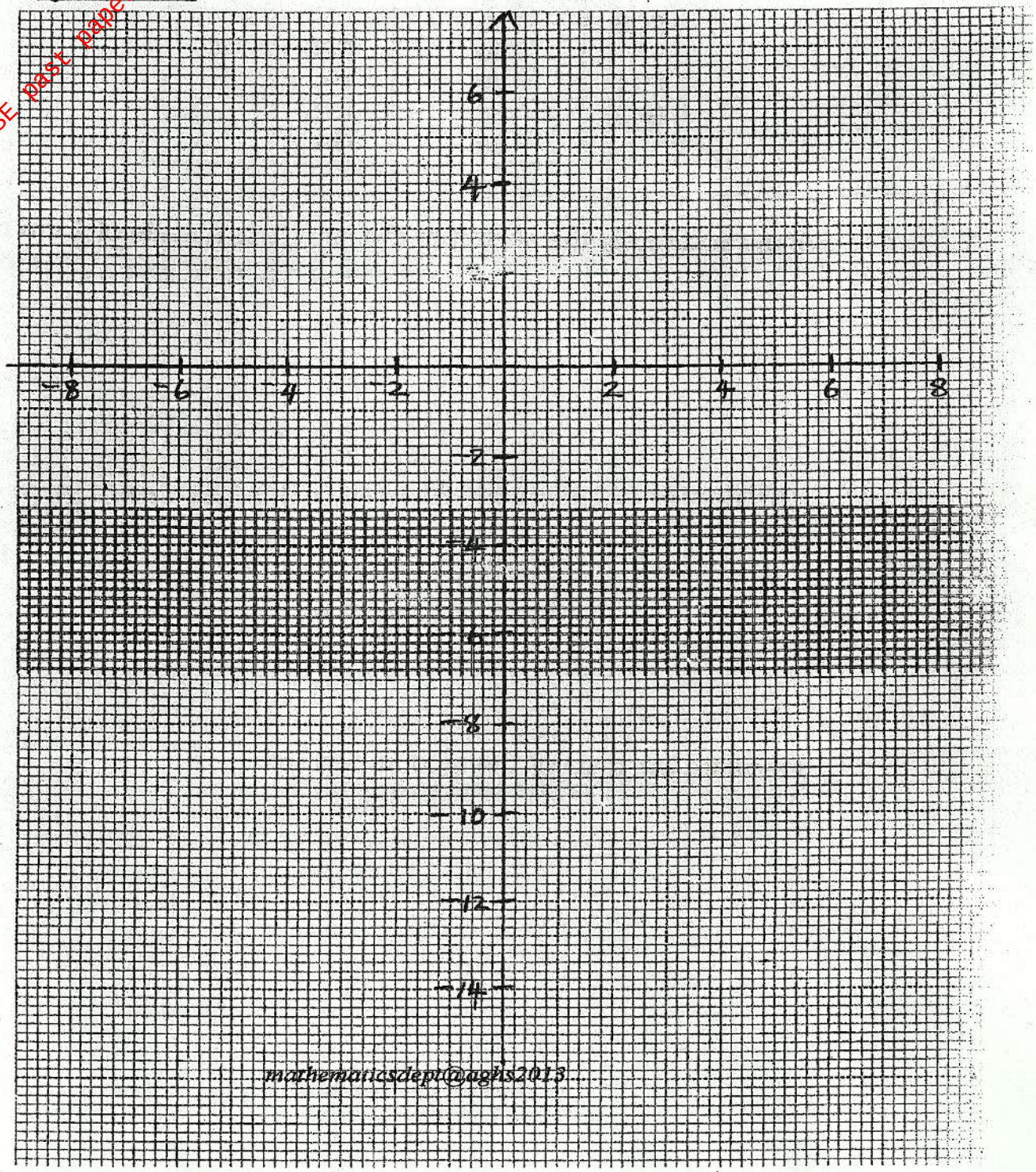
b) On the grid provided in the next page, draw the graph of the funct
$y = 3 - 4x - 2x^2$ for $-4 \leq x \leq 2$

(3 m

c) Use the graph to estimate the roots of the equation
$3 - 4x - 2x^2 = 0$ (2m

d) By drawing a suitable straight line, on the same axis find graphic
the roots of the equation $5 - 6x - 2x^2 = 0$ (3m

Question 22



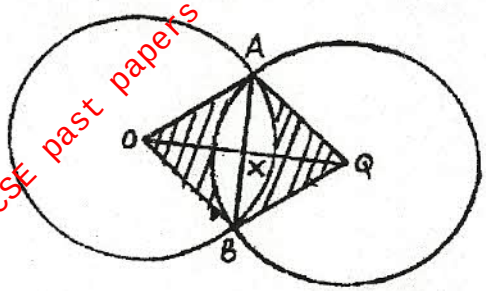
23. The table below gives a field book showing the results of a survey of a section of a piece of land. All measurements are in meters, and A to H is 100m.

	H	
D33	95	
	90	E36
C21	70	
B42	30	F25
	25	G40
	A	

Show accurately the sketch of the land (use a scale of 1 cm rep 10m). (4 mks)

Calculate the area of the land in hectares. (6 mks)

24. Two equal circles with centers O and Q and radius 8cm intersect at point A and B as shown below.



Given that the distance between O and Q is 12cm and that line AB meets OQ at X.

(i) Taking $\pi = \frac{22}{7}$ find to 4 s.f:

a) the length of the chord AB. (2mks)

b) the area of the shaded region. (7mks)

(ii) Find the reflex angle AOB. (1mks)