AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

MAY 2012

Mathematics Paper II

Time allowed: 2 hours 20 minutes Marks 45

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign that it is correct.

I agree that this is my name and school. **Candidate's signature**

2. RUBRIC. There are ELEVEN questions. Answer ALL ELEVEN questions. Choices are specified inside the paper.

3. When answering the questions:

   Read each question carefully.
   Use a black pencil for diagrams. DO NOT use coloured pencils.
   DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.
   Complete your answer in the allocated space only. DO NOT write outside the answer box.

4. The marks for the questions are shown in brackets ( ).

5. You may use a simple calculator if you wish.

(ATTEMPT EITHER PART a OR PART b OF Q.1.)

Q.1. (Total 5 Marks)

a.

i. Simplify $\frac{l - m}{l - n} \times \frac{m - n}{m - l} \div \frac{m - n}{l - n}$. (3 Marks)

ii. Simplify $\frac{1 - \frac{1}{a^2}}{1 - \frac{1}{a}}$. (2 Marks)

(ATTEMPT EITHER PART a OR PART b OF Q.1.)

b.

i. Find the square root of $\left(2a^{6} + \frac{2a^{10}}{a^{4}}\right)$. (3 Marks)

ii. Find the square root of $\frac{1}{(a + b)^{-4}}$. (2 Marks)

Q.2. (Total 3 Marks)

If $\frac{3x}{x^2 - x} = \frac{A}{x} + \frac{3}{x - 1}$, then find the value of A.

(ATTEMPT EITHER PART a OR PART b OF Q.3.)

Q.3. (Total 5 Marks)

a. If $\frac{x}{3} - \frac{2 - x}{4} = 1 - \frac{x}{6}$, then find the solution set.

b. Find the solution set of $-|2x - 7| > -1$, where $x \in N$.

Q.4. (Total 5 Marks)

The following table shows the conversion between the temperature in degree Celsius and degree Fahrenheit.

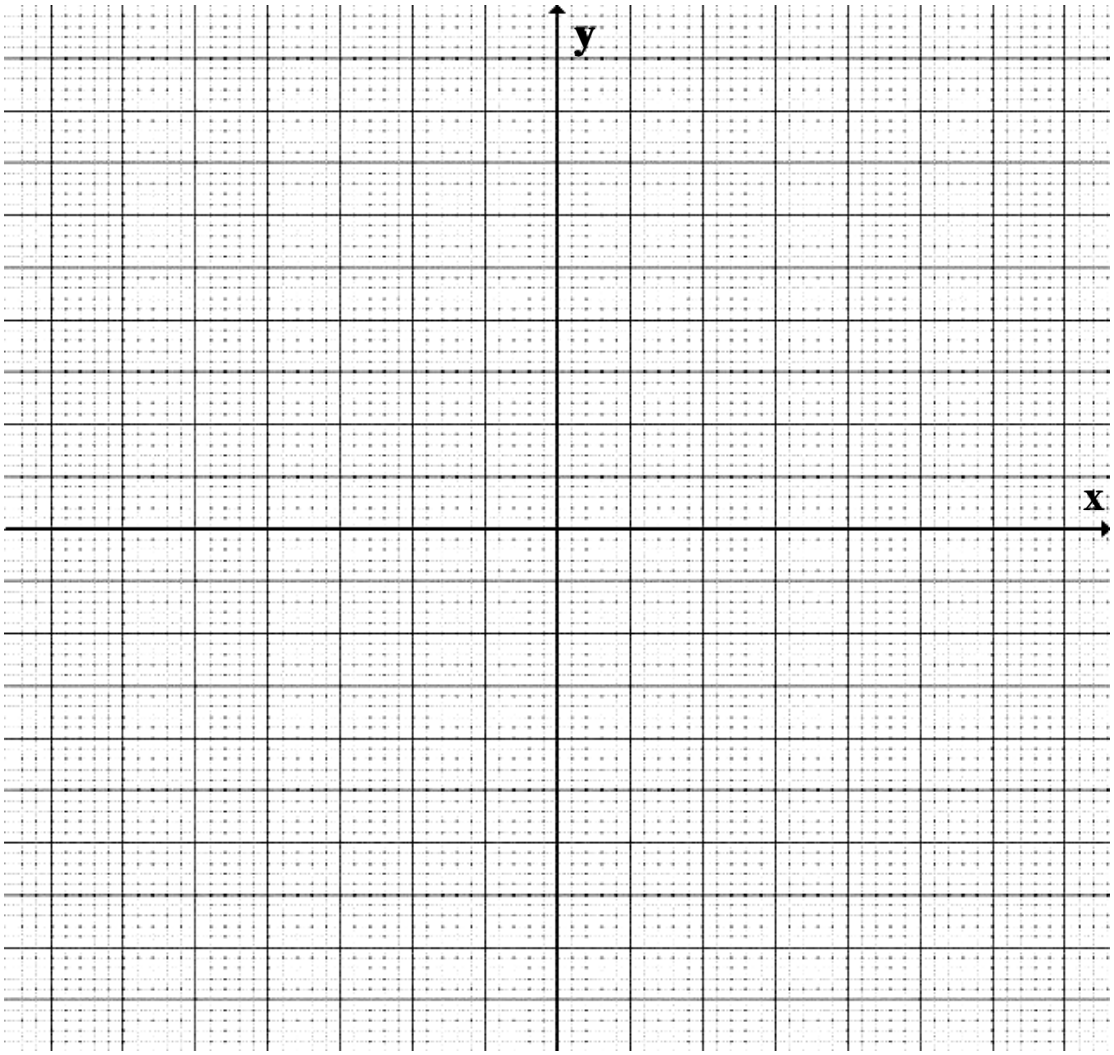
Celsius $(x°\text{C})$	10	30
Fahrenheit $(y°\text{F})$	50	86

i. Draw the graph of y against x. (3 Marks)

Use the graph to estimate

ii. the corresponding value in ^{o}C for 50^{o}F. (1 Mark)

iii. the corresponding value in ^{o}F for –10^{o}C. (1 Mark)



Q.5. (Total 4 Marks)

Find the values of m if $\frac{1}{m-6} + \frac{1}{m+6} = \frac{m^2}{(m-6)(m+6)}$.

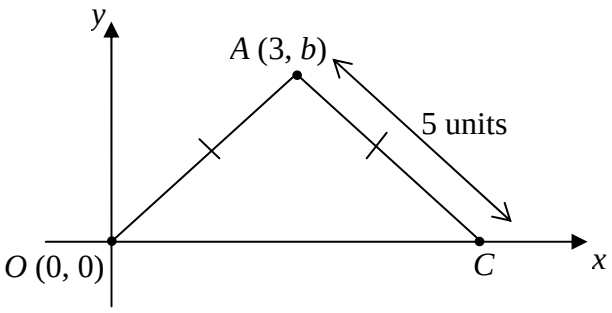
(ATTEMPT EITHER PART a OR PART b OF Q.6.)

Q.6. (Total 3 Marks)

a. If the mid point of A (3 , 0) and C (– 1 , k) is M (x , 4), then find the values of x and k.

(ATTEMPT EITHER PART a OR PART b OF Q.6.)

b. Given that AOC is an isosceles triangle as shown in the diagram, find the value of b.

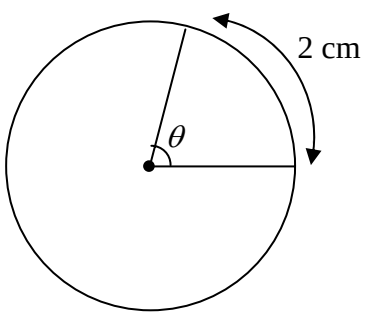


(ATTEMPT EITHER PART a OR PART b OF Q.7.)

Q.7. (Total 4 Marks)

a. If $3\cos^2\theta + 5\sin^2\theta = 5$, then prove that $\sin\theta = \pm 1$.

b. If the circumference of the circle is 4π cm and the arc length is 2 cm, then find the value of θ.

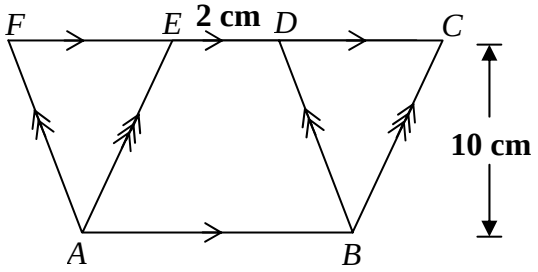


(ATTEMPT EITHER PART a OR PART b OF Q.8.)

Q.8. (Total 4 Marks)

a. Show that the sides $(a - b)$, $2\sqrt{ab}$ and $(a + b)$ represent a right angled triangle, where *a* and *b* are positive integers.

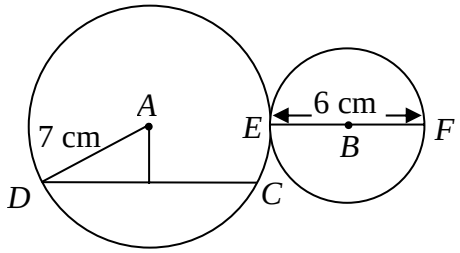
b. In the given figure, $ED = 2$ cm and area of parallelogram $ABDF = 80$ cm^2.
Find the length of *DC*.



NOT TO SCALE

Q.9. (Total 4 Marks)

A and *B* are the centres of the circles as shown in the diagram.

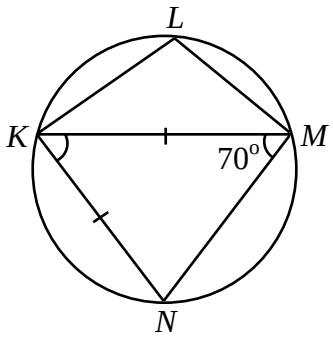


i. Give a reason why *ADC* is an isosceles triangle. (1 Mark)

ii. Show that *AB* = 10 cm and give a reason to support your answer. (3 Marks)

Q.10. (Total 4 Marks)

For the given figure, find

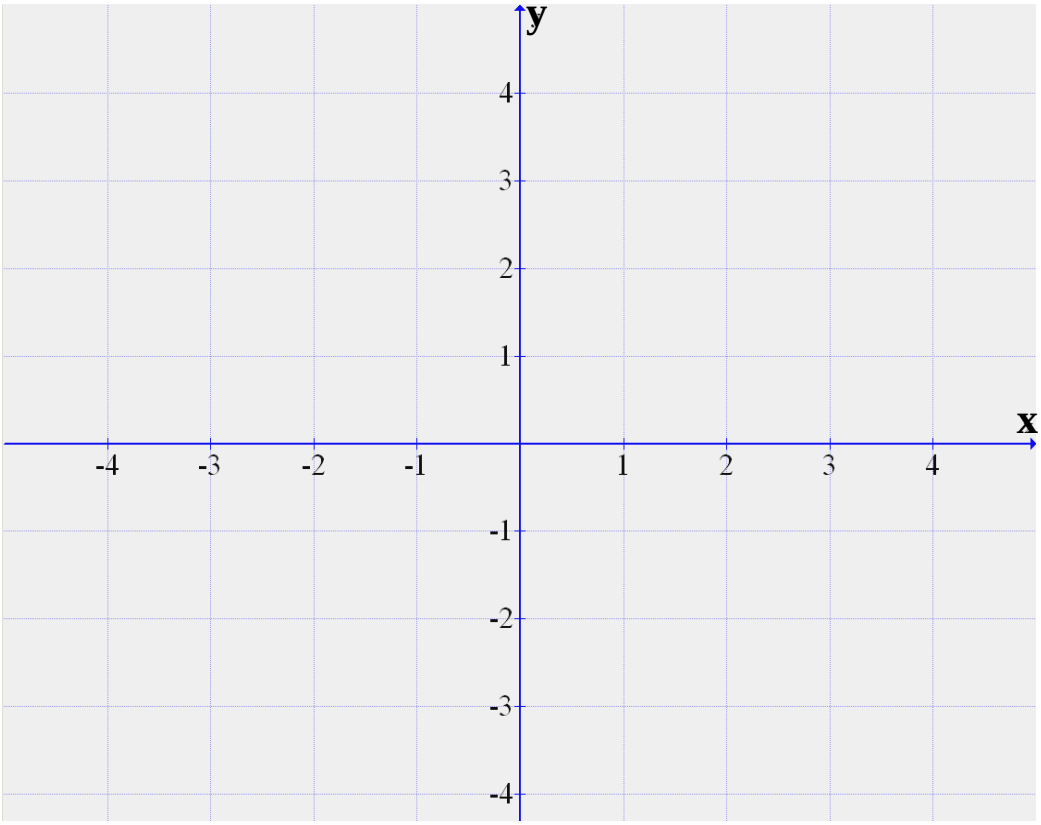


i. the sum of angles $K\hat{L}M$ and $K\hat{N}M$ .Also give a reason to support your answer. (2 Marks)

ii. the angle $M\hat{K}N$. (2 Marks)

Q.11. (Total 4 Marks)

Draw a circle passing through the points D (3, 0), E (0, – 2) and F (– 3, 4).
Also show all the necessary steps.



END OF PAPER

Please use this page for rough work

Please use this page for rough work