

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

MAY 2016

Mathematics Paper II

Time: 2 hours 20 minutes Marks: 45

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

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

2. RUBRIC. There are ELEVEN questions. Answer ALL questions. Choices are specified inside the paper.
3. When answering the questions:

Read each question carefully.
Use a black pointer to write your answers. DO NOT write your answers in pencil.
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)

- Find the highest common factor (H.C.F.) and the least common multiple (L.C.M.) of the expressions $y^3 + ay^2 + y^2 + ay$ and $a^3 + a^2y$.
- Find the value of b if the expression $4x^4 + 20x^3 + 33x^2 + 20x + b$ is a perfect square.

AKU-EB MAY EXAMINATIONS 2016

Q.2.

(Total 3 Marks)

In resolving $\frac{3x-2}{(2x-1)(x+1)} = \frac{A}{(2x-1)} + \frac{B}{x+1}$ into its partial fraction, find the value of B .

ONS 2016

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

Q.3.

(Total 5 Marks)

a. Find the solution of the following linear inequality and represent its solution on the number line.

$$\frac{3+x}{2} < \frac{5x-13}{3}, \text{ where } x \in R.$$

b. Find the solution set of the equation $\frac{|2x-4|}{5} = 2(3x-1)$, where $x \in R$.

AKU-EB

PLEASE TURN OVER THE PAGE

Q.4.

(Total 4 Marks)

For the following system of simultaneous linear equations, find the value of y .

$$x + 2y = 159$$

$$2x + y = 147$$

AY EXAMINATIONS 2016

Q.5.

(Total 4 Marks)

Find the solution set of the equation $6x^2 + x - 2 = 0$.

MAY EXAMINATIONS 2016

AKU-EB MAY EXAMINATIONS 2016

PLEASE TURN OVER THE PAGE

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

Q.6. (Total 3 Marks)

- a. A map is drawn on a Cartesian plane. Town A is located at $(4, 3)$ and town B is located at $(10, 11)$. If a bus travels in a straight line from town A to town B , then find the distance between the two towns in kilometres? **(Note: One map unit equal to one kilometre.)**
- b. If midpoint of a line segment lies at the origin and one of the end points is $(2a, -3b)$, then find the other endpoint of the line segment.

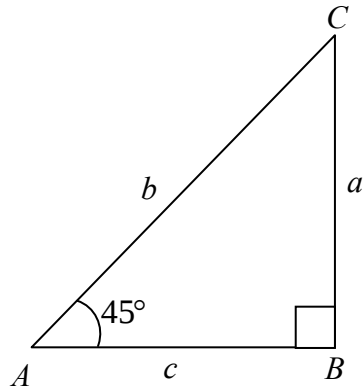
AKU-EB MAY EXAMINATIONS 2016

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

Q.7.

(Total 4 Marks)

- Verify that $(1 + \tan^2 \theta)(1 - \cos^2 \theta) = \tan^2 \theta$.
- Using the given figure, calculate the values of $\sin 45^\circ$ and $\tan 45^\circ$ independent of a , b and c .



NOT TO SCALE

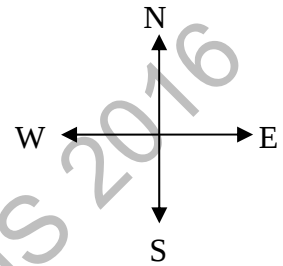
PLEASE TURN OVER THE PAGE

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

Q.8. (Total 4 Marks)

- a. Sara started riding a bicycle from her home and travelled 6 km west to reach a point A . Then she travelled 8 km north and reached a point B . Illustrate the situation by drawing a sketch and calculate the shortest distance between point B and her home.

Space for sketch



b. The lengths of the sides of a rectangle are 8 cm and 6 cm.

i. Find the length of its diagonal. (2 Marks)

ii. If the length of the diagonal of this rectangle is the same as that of a square, then find the side of the square. (2 Marks)

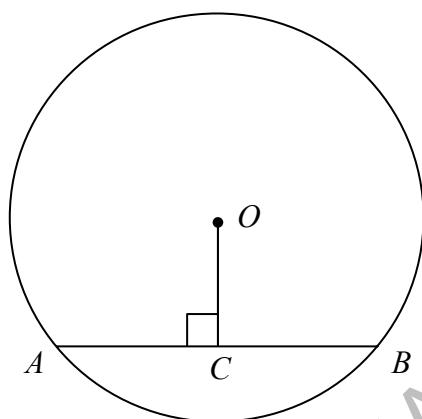
AKU-EB MAY EXAMINATIONS 2016

Q.9.

(Total 4 Marks)

A circle with centre O is shown in the diagram.

- i. If $m\overline{AC} = 5\text{ cm}$, then find $m\overline{AB}$ and write the reason to justify your answer. (2 Marks)
- ii. Is $m\overline{AC} > m\overline{OA}$? Write the reason to justify your answer. (2 Marks)

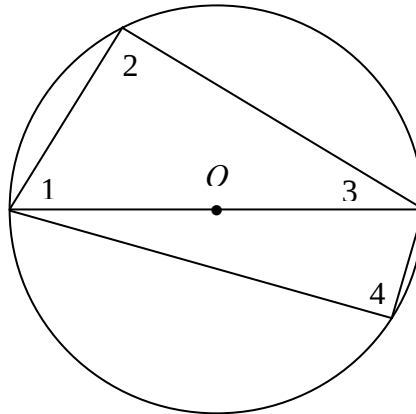


NOT TO SCALE

Q.10.

(Total 4 Marks)

A circle with centre O is shown in the diagram.



NOT TO SCALE

- i. Find $m\angle 2 + m\angle 4$ and write the reason to justify your answer. (2 Marks)
- ii. Is $m\angle 1 + m\angle 3 > m\angle 4$? Write the reason to justify your answer. (2 Marks)

PLEASE TURN OVER THE PAGE

Q.11.

(Total 5 Marks)

Construct an equilateral triangle with measure of each side equal to 5 cm and draw the circumscribed circle of the triangle.

Space for diagram

AKU-EB MAY EXAMINATIONS 2016

END OF PAPER

Please use this page for rough work

AKU-EB MAY EXAMINATIONS 2016

Please use this page for rough work

AKU-EB MAY EXAMINATIONS 2016

Please use this page for rough work

AKU-EB MAY EXAMINATIONS 2016

Please use this page for rough work

AKU-EB MAY EXAMINATIONS 2016