AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

APRIL/ MAY 2017

General 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 TEN 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 or correcting fluid.
   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 the given rational expression to its lowest term. (3 Marks)

$$\frac{4x^2-4x+1}{4x^2-1}.$$

ii. Find the value of $1-\frac{3x^2}{4}-\frac{2x}{2}$ at $x=-2$. (2 Marks)

b.

i. Given that $a+b=9$ and $a^2+b^2=41$, find the value of $a-b$ using algebraic method. (3 Marks)

ii. Use values of part i. to find the value of $4ab$. (2 Marks)

(ATTEMPT EITHER PART a OR PART b OF Q.2.)

Q.2. (Total 5 Marks)

a. Factorise completely the given expression $9(a+b)^2-4(a-b)(a-b)$.

b. Factorise completely the given expression x^3-x^2+3x-3.

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

Q.3. (Total 4 Marks)

a. Find the highest common factor (H.C.F.) of $8a^3 - 1$, $4a^2 - 1$ and $(2a-1)(2a-1)$.

b. Simplify the expression $\frac{x^3 - 27}{(x-3)(x+3)} \div \frac{x^2 + 3x + 9}{(x-3)^2}$.

Q.4. (Total 5 Marks)

i. Find the solution set of the linear equation $x-\frac{2}{3}=\frac{2x}{3}+\frac{7}{3}$. (3 Marks)

ii. Find the solution set of the linear inequality $12>3x$, where $x \in N$. (2 Marks)

(ATTEMPT EITHER PART a OR PART b OF Q.5.)

Q.5. (Total 5 Marks)

a. Find the values of x for $6x^2 - 31x = -35$

b. Solve $x^2 - x = 12$ by completing square method.

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

Q.6. (Total 5 Marks)

a. Find the value of matrix X in the following equation.

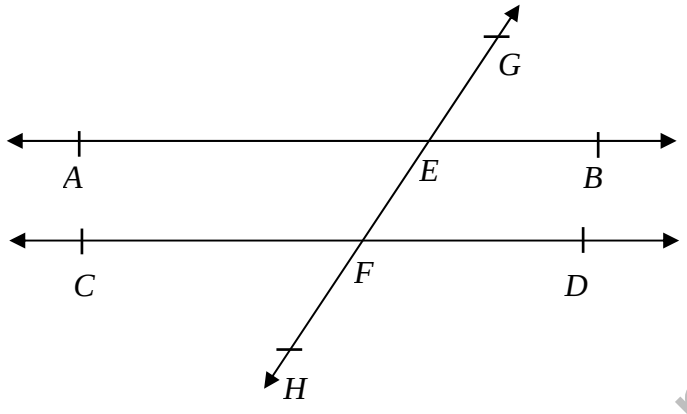
$$2X - \begin{bmatrix} 2 & 3 \\ 2 & 3 \end{bmatrix} \times \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \times \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$$

b. Find the values of x and y for the given simultaneous linear equations using the inverse matrix method.

$$2x + 3y = -2$$
$$5x + 2y = 17$$

Q.7. (Total 5 Marks)

If in the given diagram lines *AB* and *CD* are parallel to each other, then complete the following statements.



i. One pair of vertically opposite angles is (1 Mark)

_____

_____

ii. One pair of adjacent angles is (1 Mark)

_____

_____

iii. One pair of corresponding angles is (1 Mark)

_____

_____

iv. One pair of alternate angles is (1 Mark)

_____

_____

v. One pair of supplementary angles is (1 Mark)

_____

_____

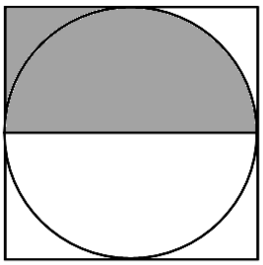
Q.8. (Total 4 Marks)

Construct an equilateral triangle *ABC* with each side measuring 3 cm. Also draw any two altitudes of triangle *ABC*.

Space for diagram

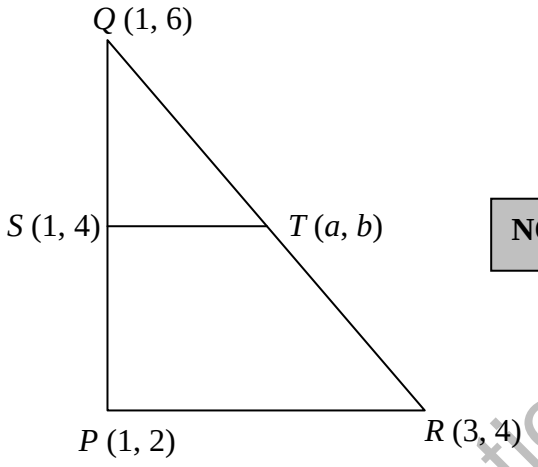
Q.9. (Total 4 Marks)

In the given diagram, the area of the square is *s* and the area of the circle is *c*. Find the area of the shaded region in the diagram.



Q.10. (Total 3 Marks)

The coordinates of the vertices of a triangle *PQR* are *P* (1, 2), *Q* (1, 6) and *R* (3, 4). The midpoints of *PQ* and *QR* are *S* (1, 4) and *T* (*a*, *b*) respectively. Find the coordinates of point *T* and distance between *S* and *T*.



NOT TO SCALE

END OF PAPER

Please use this page for rough work

Please use this page for rough work

Please use this page for rough work

Please use this page for rough work

Please use this page for rough work