UNEB U.C.E MATHEMATICS (PAPER 1) 2017

SECTION A
Answer all questions in this section

1. Factorize :$(x+4)^2 - (x-3)^2$

2. Solve the simultaneous equations
   $2x-3y-7=0$
   $x+4y+2=0$

3.The table below shows marks obtained by 34 students in a Chemistry test. Calculate the mean mark.

Marks	**Number of Students**
20-29	3
30-39	5
40-49	8
50-59	8
60-69	10

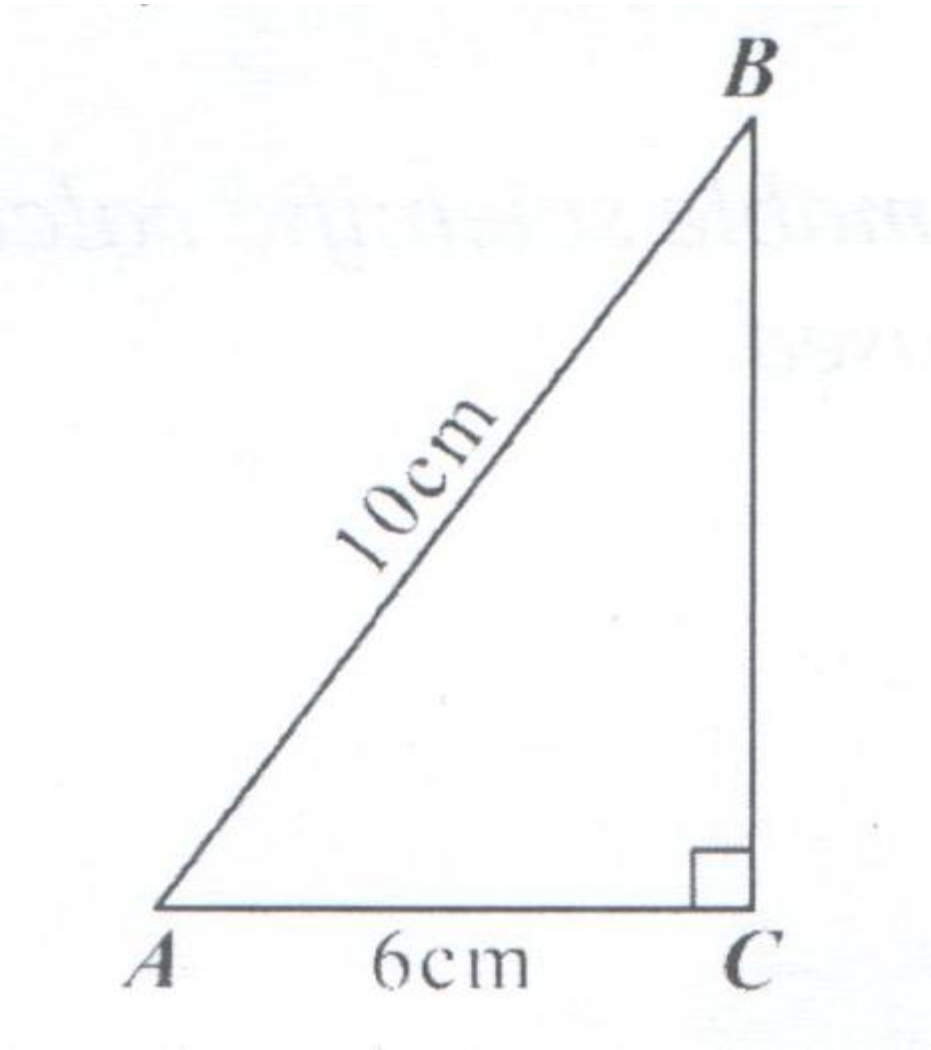
4.Given that $s*t=2s^2 - 3t$, evaluate 6*(5*2)

5. An interior angle of a regular polygon is 162^0. Find the sum of its interior angles.

6.Find the values of x and y in $3\begin{pmatrix} x & 0 \\ 0 & y \end{pmatrix} - 2\begin{pmatrix} x & 0 \\ 0 & y \end{pmatrix} = \begin{pmatrix} 3 & 0 \\ 0 & 4 \end{pmatrix}$

7. Solve for x in the inequality ½ - # x< # x- ¼

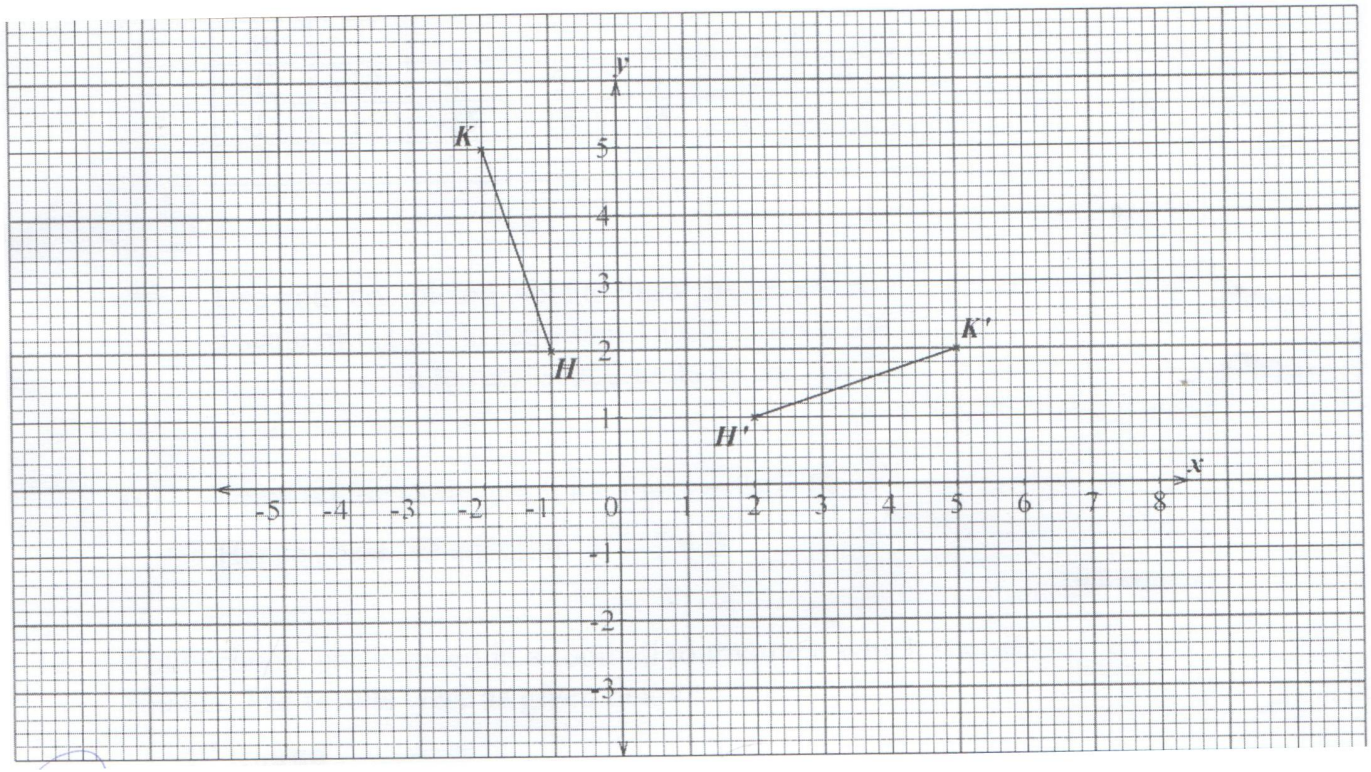
8. In the right angled triangle ABC below, AB = 10cm and AC = 6cm



Determine the;
a) Length of BC
b) area of triangle ABC

9. A number which is divisible by 3 is chosen at random from a set of even numbers between 1 and 20. What is the probability of choosing the number?

10. The graph below shows the line HK and its image H# K### after a rotation in the clockwise direction.



Use the graph to determine the;
coordinates of the centre of rotation
angle of rotation

SECTION B
Answer any five questions from this section. All questions carry equal marks.

11.Copy and complete the table of values below for $y = x^2 + 2x - 15$.

x	-6	-5	-4	-3	-2	-1	0	1	2	3	4
x^2	36				4				4		
$2x$	-12	-10	-8	-6	-4	-2	0	2	4	6	8
-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
y	9				-15				-7		

a) Use your completed table to draw the graph of $y=x^2+2x-15$. Use a scale of: 1cm to represent 1 unit on the x-axis, 1cm to represent 2 units on the y- axis.

b) Draw on the same graph the line $y = 2x-14$
Hence solve the equation $x^2-1=10$.

12. Four schools participated in a football tournament which was played in two rounds. The results were as given below;

1st Round
- Bakulu S.S won one, drew three and lost two matches
- Dodo S,S won two, drew two and lost two matches.
- Kawunga S,S won three, drew two and lost four matches.

2nd Round
- Bakulu S,S won one, drew two and lost three matches

- Dodo S,S won two, drew one and lost three matches
- Kawunga S,S won two, drew three and lost one match
- Oronga S,S won one, drew four and lost one match.

a) Write down a 4 × 3 matrix which shows the performance of the schools in
   i) each of the two rounds
   ii) both rounds
b) Three points are awarded for a win, one point for a draw and no point for a loss.
   i) Write down a 3× 1 matrix to represent the award of points#
   ii) Using matrix multiplication, determine which school won the tournament.

13.a) Make D the subject of the expression

$$L = \sqrt{\frac{3B}{T - D}}$$

Hence, find the value of D when B = 540, L =18 and T = 17
b) Auma bought 5 sackets of washing powder and a tube of toothpaste at shs1,700 in January. In February she bought 15 sackets of washing powder and 2 tubes of toothpaste at Shs4,400. What was the price of each item during the two months?

Using a ruler, a pencil and a pair of compasses only,
construct a triangle *ABC*, where angle *ABC* = 750, *AB* # = 9.3cm, *BC* # = 8.7cm

b) Measure the length of *AC* # and angle *ACB*

c) i) Draw an inscribed circle in the triangle ABC

ii) Find the radius of the circle

15. A cupboard has 5 white cups and 3 black cups. Two cups are picked from the cupboard one after the other without replacement.

a) Draw a tree diagram to represent the given information

b) Calculate the probability of picking :

i) one white cup and one black cup
ii) two cups of the same color
iii) at least one white cup

16. A triangle whose vertices are *P*,*Q* and *R* is mapped on a triangle whose

(5,7) and *R'* (0,2) by a matrix of transformation $\begin{pmatrix} 3 & -1 \\ 4 & -1 \end{pmatrix}$. The triangle P Q R is then mapped onto triangle P Q R by a matrix of transformation $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$.

vertices

Find the;

a) coordinates of P## Q## and R##

b) single matrix of transformation which would map P## Q## R## back onto PQR.

c)coordinates of P## Q## and R##

17. An investor wants to buy 2 types of generators A and B. Generator A needs 2 m^2 of space and B needs 3m^2. The available space is only 60m^2. The cost of A is £2,000 and that of B is £10,000. The investor has £80,000 to be spent. If x and y represent number of generators of type A and B respectively,

a) write down four inequalities from the information given

b) represent the four inequalities on the same axes.

c) find the greatest number of generators of both types A and B that the investor can buy using the minimum amount of money

END