UNEB U.C.E MATHEMATICS PAPER 1 2018

Answer all questions in this section

1. Given that $m * n = \frac{3m-n}{2}$ evaluate 6* (3*1)

2. Find the integral values of y in the inequality 2y + 3 < 27 if y >9.

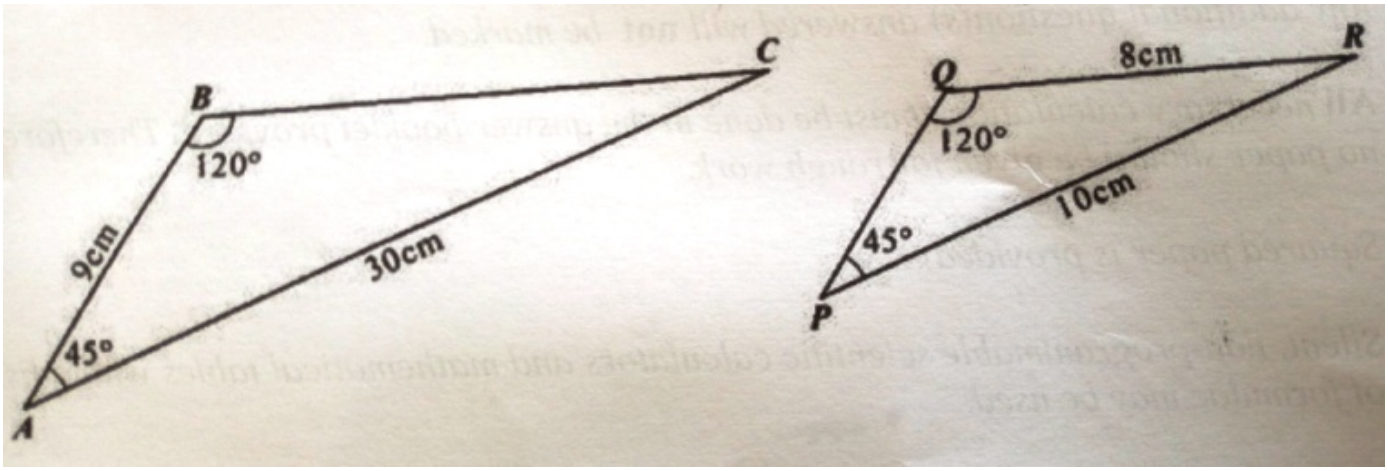
3. Determine the inverse $(P^{-1})\text{of } P = \begin{pmatrix} 4 & 6 \\ -4 & -5 \end{pmatrix}$

4. The ages in years of six girls are as follows: 17, 8,15,12,15,13. What would be the age of the seventh girl that would make the mean age of all the girls to be 13 years?

5. Factorise $3x^4 - 48y^4$ completely.

6. Form a quadratic equation in x whose roots are -3 and ¼

7. The triangles ABC and PQR shown below are similar

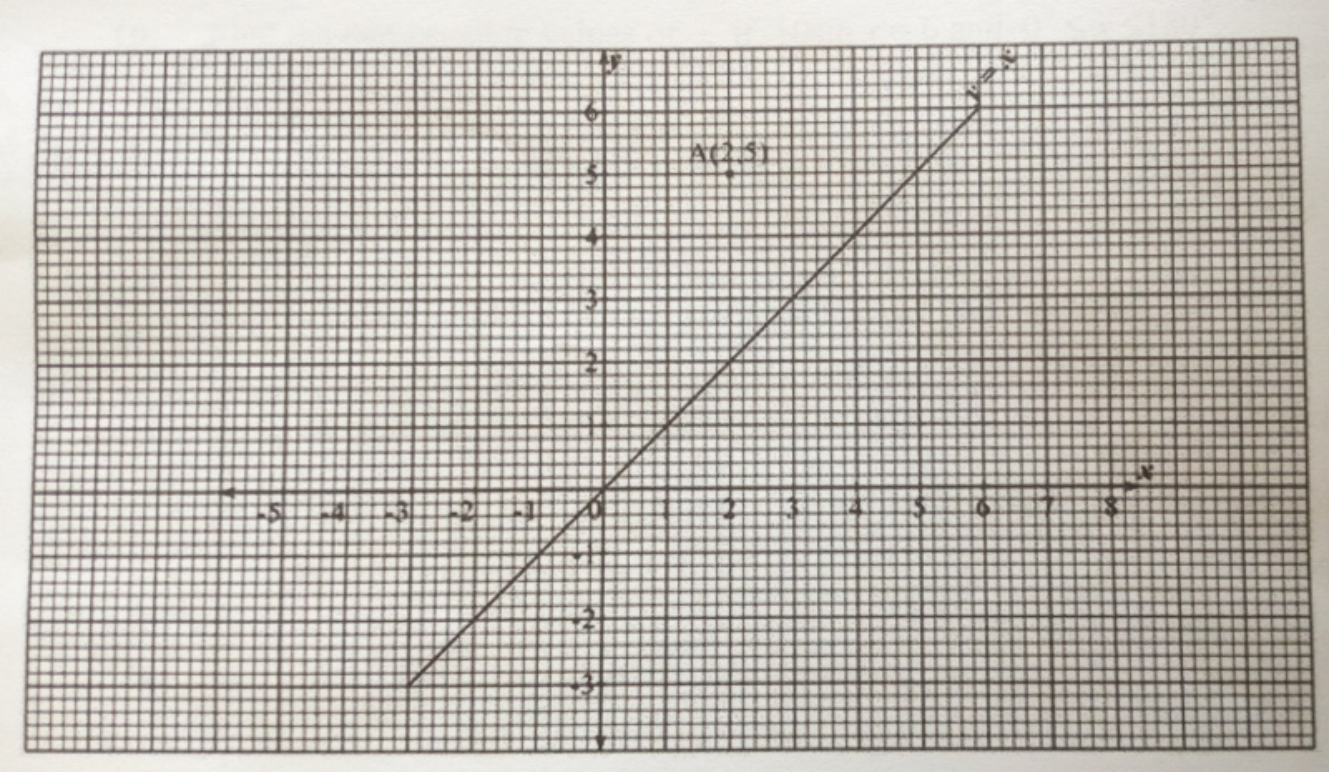


Find the lengths of

a) PQ

b) BC

8. A point A(2,5) is reflected in the line y=x which is shown on the graph



a) Use the graph to show A^1 the image A.

b) State the coordinates of A^1.

9. The table below shows the sum of two numbers

+	**1**	**2**	**3**
3	-	5	6
5	6	-	8
7	8	-	-

b) What is the probability that the sum is both odd and prime?a) Copy and complete the table

10. Find the two possible values of x if 10sin x=6 and $0^0 \leq x \leq 180^0$

SECTION B

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

11. A bag contains 3 black balls, 4 green balls and 5 yellow balls.

a) If two balls are picked at random without replacement, find the probability that both balls are of the same colour.

b) How many black black balls must be added to the bag so that the probability of drawing a black ball is ½?

12. a) Make N the subject of the expression

$V = MN^2 P$

Hence, find the vale of N when M=9, P= 3 and V = 243.

b) Amooti bought three books and five pens at Shs9700. If he had bought two books and eight pens, he would have spent Shs900 less. Calculate the cost of a

i) book

ii) pen

13. The verticles R(0,1), S(0,3) and T(3,1) of a triangle are mapped onto $\dot{R},\ \dot{S},\dot{T}$ by a transformation matrix $P = \begin{pmatrix} 1 & 0 \\ 2 & 4 \end{pmatrix}$

a) Find the coordinates of the image triangle $\dot{R},\ \dot{S},\dot{T}$

b) Use the determinant of P to find the ratio of the area of triangle RST to the area of triangle $\dot{R},\ \dot{S},\dot{T}$.

c) Determine the matrix of transformation which maps $\dot{R},\ \dot{S},\dot{T}$ back onto RST

14. Using a ruler, a pencil and a pair of compasses only

a) construct a triangle ABC, in which angle BAC = 30^0, angle ABC is 120^0 and = 8cm.

b) Measure and record the lengths AC and BC

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

ii) Measure and record the radius of the circle.

15. a) Copy and complete the table below for values $10-x^2$

x	-4	-3	-2	-1	0	1	2	3	4
$10-x^2$	-6		6	9	10	9		1	-6

i) Using 2cm for 1 unit on the x-axis and 1cm for1 unit on the y- axis, draw the graph of $y = 10-x^2$

ii) Use your graph to solve the equation $10-x^2 = 0$.

b)i) On the same axes, draw the graph of the equation $y = 2x + 3$

ii) Use your graphs to solve the equation $x^2 + 2x - 7 = 0$

16. a) Using matrix method, solve the following simultaneous equations

$3x-4y-1 = 0$

$6x - 6y = 5$

b) Three girls went shopping and bought loaves of bread, cakes and packets of biscuits. Ann bought 2 loaves, 3 cakes and 6 packets of biscuits. Betty bought 3 loaves, 4 cakes and 5 packets of biscuits. Caroline bought 3 loaves, 6 cakes and 3 packets of biscuits.

i) Represent this information in matrix form.

ii) One loaf cost Shs3,500, one cake costs Shs500 and a packet of biscuits costs Shs2,000. Using matrix multiplication obtain the money spent by each girl. Hence, determine the total amount spent by the three girls.

17. A wholesaler wishes to transport at least 240 bags of sugar from the factory to his shop. He has a lorry that can carry 90 bags per trip and a pick-up that can carry 20bags per trip. The cost of each trip is Shs 50,000 for the lorry and Shs 15,000for a pick-up. He has Shs180,000 available to transport the sugar. The pick-up makes more trips than the lorry. If x is the number of trips to be made by the lorry and y the number of trips to be made by the pick-up;

a) Write down five inequalities to represent the given information

b) Represent the inequalities on a graph

c) Use the graph to find the possible number of trips to be made by the lorry and the pick-up. Hence find the minimum cost of transporting the bags of sugar.