4

SECTION A

1. Solve the simultaneous equations below **(05 marks)**
2. Show that is a root of the equation hence find other roots **(05 marks)**
3. Given that and , show that **(05 marks)**
4. Solve the equation **(05 marks)**
5. Given that OP=I+2j-k and OQ=I+4k find the coordinates of point M that divides PQ externally in the ratio 1:2 **(05 marks)**
6. In how many ways can the letters of the name be arranged if;
7. There is no restriction **(02 marks)**
8. All vowels are together **(03 marks)**
9. Prove that the circles and are orthogonal **(05 marks)**
10. Find the area of the region bounded by the curve **(05 marks)**

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1. (a) The progression below is arithmetic. find the number of terms required to give a sum of 1624 if the progression is **(05 marks)**

b) An A.P has a common difference of 2 while a G.P has a common ratio of 2. When the 26th term of the AP is subtracted from the 6th term of the GP, the result is 132. When the fourth term of the AP is subtracted from the third term of the GP, the result is 5. Determine the first term of the;

(i) AP

(ii) GP .  **(08 marks)**

1. Given the equation
2. Show that x=2 is a factor  **(03 marks)**
3. Deduce the other roots and hence obtain values of given that are the other roots of the equation hence form a quadratic equation in p whose roots are and .  **(09 marks)**
4. Expand in ascending powers of x up to the fourth term. Hence use to evaluate  **(12 marks)**
5. (a) Given that A,B, and C are angles of a triangle, prove  **(06 marks)**

b) Use, solve the equation for  **(06 marks)**

1. (a) Given that find the values of Z given that is the conjugate of Z  **(06 marks)**

b) Show that the locus represented by complex is of a circle hence state its center and radius  **(06 marks)**

1. Two circles have centers A(1, 1) and B(9, 7). If these two circles touch externally and have the same radii r, obtain the;
2. Equation of both circles
3. Equation of the line of intersection
4. Point of intersection.
5. Differentiate with respect to x and simplify
7. **(04 marks)**
8. **(04 marks)**

16. four points A(3, 4, 7) B(13, 9, 2) C(1, 2, 3,) and D(10, K, 6). The lines AB and CD intersect at Pdetermine the:

(I)Vector equations of AB and CD(06 marks)

(II) Value of k (**o4 marks)**

Coordinates of P. **(02 marks**  **(06 marks)**