**MID-TERM 2 EXAMINATIONS**

Senior five

Pure Mathematics, Paper 1

**Time: 2 Hours**

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| ***INSTRUCTION:***   * *Answer* ***all*** *the* ***questions*** |  |

**SECTION A (40 MARKS)**

**Qn 1:** An arithmetic progression contains terms. The first term is 2 and its common difference is . If the sum of the last four terms is 72 more than the sum of the first four terms, find. [5marks]

**Qn 2:** Differentiate with respect to from first principles. [5marks]

**Qn 3:** Solve for , , where . [5marks]

**Qn 4:** Find the shortest distance of a point from the line . [5marks]

**Qn 5:** Expand, is ascending powers upto the term in . Taking , find the approximate value of to 4 significant figures.

[5marks]

**SECTION B (60 MARKS)**

**Question 6:**

1. If the roots of the equation are and ;
2. Prove that.
3. Find a quadratic equation whose roots are and .

[12marks]

**Question 7:**

1. Find x if tan-1(x) + tan-1(1-x) = tan-1
2. Prove that . Hence show that [12marks]

**Question 8:**

(a). Given two vectors and ; find:

(i). the angle between and ,

[2marks]

(ii). a vector that makes a right angle with and with .

[3marks]

(b). Find the Cartesian equation of the line passing through the points , . Hence find the shortest distance from the line to the point

[7marks]