**456/1**

**MATHEMATICS**

**PAPER 1**

**JULY/AUGUST 2011**

**2½ HOURS**

**JOINT MOCK EXAMINATIONS 2011**

**Uganda Certificate of Education**

**MATHEMATICS**

**PAPER 1**

**2 HOURS 30 MINUTES**

**INSTRUCTIONS TO CANDIDATES**

Answer **all** questions in section **A** and any **five** questions form section **B**.

All necessary calculations must be shown clearly with the rest of the answer.

Graph papers and mathematical tables are provided

Silent non- programmable scientific calculators may be used.

State the degree of accuracy of your answer when using tables or calculators.

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1. Factories by grouping
2. Without using tables or calculator, evaluate
3. Solve the equation
4. Simplify by rationalizing and express in the form the expression.
5. In the figure below, is a cyclic quadrilateral, find

1. An English soccer fan is arrested in France and has to pay a fine of 200 francs (f). He has 10000 Germany marks (DM) in his wallet. How much is he left with in US Dollar ($) after paying the fine. Given 6.17 f = $1 and 1.84 DM = $1.
2. a) Simplify
3. Evaluate without using tables or calculator.

1. Make the subject of the formula.
2. Given that is a reflex angle calculator without using tables or calculator the value of
3. A matrix transforms a figure of area Determine the area of the image under the transformation matrix P.

**(60 marks)**

1. If . Find the values of given that.

* + 1. A cylindrical tank of diameter 2.8m and height 4m has a volume of 24.64. Find the radius and height of a similar tank of volume 665.28.

1. In the diagram below , and express the following vectors in terms of the vectors.

P

Q

T

O

R

* 1. Show that
  2. Given that is produced to meet so that , express in terms of .

1. Triangle with vertices is mapped onto triangle with vertices by a reflection.
   1. Find the equation of the mirror line.
   2. Triangle is further reflected in the line to form triangle . Draw the tree triangles on the same graph and write down the co-ordinates of .
   3. Find the centre and angle of rotation that maps triangle back onto triangle
2. In a class of 47 students 26 like posho (P), 15 like matooke (M) and 36 like rice (R), 2 like non of the foods, 5 like M and P only, 10 like P and R only, 4 like Posho only and
   1. Represent the above information on a venn diagram and use it to find:
      1. The number of students who like all the 3 types of foods.
      2. The number of students who like rice only.
   2. If a student is picked at random, what is the probability that the student.
      1. Likes none of the 3 types of food.
      2. Likes at least two of the foods.
3. A) Draw the graph of the curve for values of using a scale of 1cm to represent 1 unit on both axes.
   1. Use your graph to find the roots of the equations.
   2. State the minimum value of the function and the value of for which it occurs.
4. The table below shows the marks scored by 65 students in a mathematics test with their corresponding cumulative frequencies.

|  |  |
| --- | --- |
| Marks | Cumulative frequency |
| 1 – 10 | 1 |
| 11 – 20 | 4 |
| 21 – 30 | 11 |
| 31 – 40 | 20 |
| 41 – 50 | 41 |
| 51 – 60 | 51 |
| 61 – 70 | 57 |
| 71 - 80 | 62 |
| 81 – 90 | 64 |
| 91 - 100 | 65 |

Use the table above to

a) Calculate the mean mark of the students using an assumed mean of 45.5

b) Estimate the median mark.

c) What is the class length?

1. The figure below shows a right pyramid VABCD centre O with a rectangular base ABCD.

A

B

O

V

C

D

Given that AB = 8cm, BC = 6cm and the height VO = 12cm , find

* 1. VA
  2. The angle between planes VAD and VBC
  3. The volume of the pyramid.