

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2015/2016**

FIRST YEAR FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN BRIDGING MATHEMATICS

**SMA 0005: GRAPHS**

**DATE: AUGUST 2016 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***three*** *questions*

**QUESTION ONE (30MARKS)**

1. Find the equation of a line which is parallel to the line and passes through the point A (2,4). (3 Marks)
2. Solve the following simultaneous equations graphically:

 (6 Marks)

1. Given that varies directly as the square of and when , find when . (3 Marks)
2. Solve the inequalities and giving your answer as a combined inequality. List all the integral values of x that satisfy the combined inequality above. (4 Marks)
3. Make r the subject of the formula

 (4 Marks)

1. For each of the following straight lines equations, determine the gradient and y-intercept.
2.  (2 Marks)
3.  (2 Marks)
4. State the co-ordinates of the image of A(2,1), B(5,1) and C(5,4) under the transformation

 (3 Marks)

1. Draw the triangle ABC and its image on the same axes. (3 Marks)

**QUESTION TWO (10 MARKS)**

1. Using interval of 30o, draw on the same axes the trigonometric graph of the function and for the value  (7 Marks)
2. By use of the graph find the value of such that  (3 Marks)

**QUESTION THREE (10 MARKS)**

1. The number of beats per minute of gong varies directly as the square root of its length. If a gong which is 49 cm long makes 36 beats per minute, how many beats per minute would a gong which is 144 cm long make? (6 Marks)
2. Find the equation of a line passing and having a gradient. (4 Marks)

**QUESTION FOUR (10 MARKS)**

By completing the table below for the equation  draw the graph of and use it to solve the following equations. (6 Marks)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 |
| y |  | 0 |  | -6 | -3 |  |  |

1.  (2 Marks)
2.  (2 Marks)

**QUESTION FIVE (10 MARKS)**

1. The table below gives corresponding values of and related to the equation  where and are constants.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
| y | 10 | 16 | 22 | 28 | 34 | 40 | 46 |

Using the appropriate scale, plot the points and draw the graph of  (3 Marks)

1. Use your graph to find the value of:
2. M and C (2 Marks)
3. X when (1 Mark)
4. Y when (1 Mark)
5. Solve the following pair of simultaneous inequalities.

 (3 Marks)

**QUESTION SIX (10 MARKS)**

A small company builds two types of decorative materials, type A and type B. Type A requires 2 hours of machine time and 5 hours of craftman time. Type B requires 3 hours of machine time and 5 hours of craftman time. Each day there are 30 hours of machine time and 60 hours of craftman time. The company produces at least each type of decorative materials. The profit on each type A decorative material is £60 and on type B is £84.

1. Formulate the linear programming problem and show the objective function that maximizes the profit. (5 Marks)
2. Show the region represented by the inequalities and from the graph, determine the number of each decorative material they should produce daily to maximize profit. (5 Marks)