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**University Examinations 2014/2015**

FIRST YEAR, SPECIAL/SUPPLEMENTARY EXAMINATION FOR BRIDGING MATHEMATICS

**SMB 0005: GRAPHS**

**DATE: OCTOBER, 2015 TIME: HOURS**

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

**QUESTION ONE - (30 MARKS)**

1. Determine the equation of a line that passes through (2,3) and is perpendicular to the line (4 Marks)
2. Solve the following pair of simultaneous equations graphically. (5 Marks)

x + 2y = 14

2x - y = 3

1. Solve the following inequalities giving the answer as a combined inequality and represent the answer on a number line. (4 Marks)

3x + 2 5 and 3x – 14 - 2

4x + y = 11

1. A quantity x is inversely proportional to the square of y. Given that x=3 when y=2, find the value of y when x =
2. A quadrilateral ABCD with co-ordinates A(1,1), B (3,1) , C(3,4) and D(1,3) is transformed under the transformation with the matrix . Write down the co-ordinates of the image (4 Marks)
3. Draw the graph of for the interval 0o, use the graph to solve the following:
4. Cos x = -0.5
5. Cos 2200 (5 Marks)
6. Make B the subject of the formula. (4 Marks)

**QUESTION TWO (10 MARKS)**

1. Complete the table below for (1 Mark)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| y | 5 | -3 | -3 |  |  |  |  |

1. Draw the graph - 2x-3 for -2 (3 Marks)
2. Use the graph to solve;
3. (3 Marks)
4. = x+2 (3 Marks)

**QUESTION THREE ( 10 MARKS)**

A college has to take 300 students for a field study. there are two types of buses available, type x and y. Type x can carry 10 students and type y can carry 30 students. They have to use not more than 20 busses. The number of type x busses used should not be less than type y.

1. Write all the inequalities which represent the above information. (3Marks)
2. Draw the inequalities and shade the unwanted region. (3 Marks)
3. If the charges of hiring were : type x – shs 10,000

type y – shs 8,000

Use the graph to find the number of each type of bus that should be hired to maximize the cost and hence determine the maximum cost. (4 Marks)

**QUESTION FOUR (10 MARKS)**

1. Copy and complete the table below; (3 Marks)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X0 | -30 | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 |
| Sin (X0+300) | 0 | 0.5 | 0.87 |  |  |  |  |  |  |  |
| Cos(X0-150) |  | 0.95 |  |  |  |  |  |  |  |  |

1. Using an appropriate scale, plot the curve y= Sin(x +30) and y = Cos(x) for -30 (5 Marks)
2. Use the graph to find the value of x such that ;
3. Cos (x (2 Marks)

**QUESTION FIVE (10 MARKS)**

a) Draw the triangle whose vertices are P(2,2), Q(5,1) and R(5,4) (1 Mark)

On the same axes, draw the images of PQR under transformation with the matrices given and in each case describe fully the transformation.

b) Transformation (3 Marks)

c) Transformation Q (3 Marks)

d) Transformation H (3 Marks)

**QUESTION SIX (10 MARKS)**

The data given below represents the average monthly expenditure, E in shs, on food in a certain village. The expenditure varies with the number of dependants, D in the family.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. of dependents, D | 6 | 14 | 24 | 50 | 64 |
| Expenditure, E(shs) | 420 | 500 | 610 | 880 | 1000 |

1. Plot the graph of E against D and draw the line of best fit. (3 Marks)
2. Find the gradient and the E-intercept of the graph. (3 Marks)
3. Write down the equation connecting E and D. (2 Marks)
4. Estimate the cost of feeding a family with 18 dependants. (2 Marks)