**MUKINDURI MIXED DAY SECONDARY SCHOOL**

**FORM 3 MID-TERM 2 2017**

**MATHEMATICS**

**NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM NO:\_\_\_\_\_\_\_\_\_\_**

1. Use logarithms to evaluate

(4 marks)

1. Solve for x in the equation

32(x-3)÷8 (x-4)= 64 ÷ 2x (3 marks)

1. The length and width of a rectangle measured to the nearest millimeter are 7.5cm and 5.2cm respectively. Find, to four significant figures, the percentage error in the area of the rectangle. (3 marks)
2. A financial institution charges compound interest on money borrowed. A business woman borrowed Kshs 16, 000 from the financial institution. She paid back Kshs 25,000 after 2 years. Find the interest rate per annum. (3marks)

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1. Solve for x in the equation

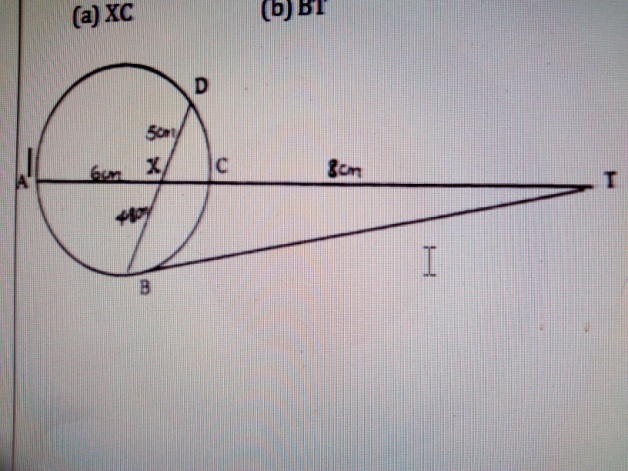
2 log10 x + log10 5 = 1+ 2log10 4 (4 marks)

1. Solve the simultaneous equations

x2 + y2 = 26

x – y = 4 (4 marks)

1. Simplify  (3 marks)
2. Given that sin a = where a is an acute angle find,without using mathematical tables:
3. cos α (2 marks)
4. Tan (90-α) (1 mark)
5. In the figure below, BT is a tangent to the circle at B. AXCT and BXD are straight lines AX = 6cm, CT = 8cm, BX = 4.8 cm and XD = 5cm.



Find the length of

1. XC (2 marks)
2. BT (2 marks)
3. In the figure above, triangle ABC is similar to triangle AED and BC // ED. Given that the ratio AB: AE = 2:5, find the ratio of the area of triangle ABC to that of the trapezium BCDE. (3 marks)

**A**

**B C**

**E D**

1. Solve the following inequalities and represent the solutions on a single number line:

3 – 2x < 5

4 – 3x ≥ -8 (3 marks)

1. Simplify the expression  (3 marks)
2. A perpendicular is drawn from a point (3, 5) to the line 2y + x = 3. Find the equation of the perpendicular. (3marks)
3. If a=0.342, b=2.43 and c=3.4,find the absolute error and percentage error made in calculating
4. a-b (2 marks)
5. ac-b ( 3 marks)
6. simplify

3log 4 + log 125 -3 log 2 (2 marks)

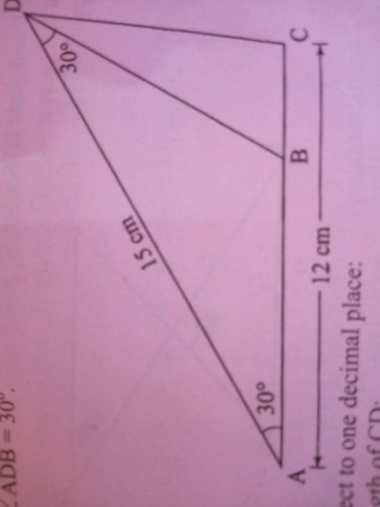
SECTION B:

Instructions: ***answer any five questions in this section.***

1. Complete the table below for the function (2marks)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -3 | -2 | -1 | 0 | 1 | 2 |
|  | 32 |  | 8 | 2 | 0 | 2 |  |
| + |  |  |  |  |  |  |  |
| -3 | -3 | -3 | -3 | -3 | -3 | -3 | -3 |
| Y |  |  |  |  |  |  |  |

1. On the graph paper provided, draw the function and use the graph to estimate the roots of the equation (3 marks)
2. Use the graph to solve (3marks)
3. In the figure below, AC=12cm, AD=15 cm and B is point on AC. Angle BAD = angle ADB= 30°.



Calculate correct to 1 decimal place:

* 1. The length of CD: (3 marks)
  2. The length of AB. (3 marks)
  3. The area of triangle BCD. (2 marks)
  4. The size of angle BDC ( 2 marks)

1. The table below shows the taxation rates in a certain year.

|  |  |
| --- | --- |
| Income in K£ p.a. | Rate of taxation in sh. per K£ |
| 1-3 900 | 2 |
| 3 901-7 800 | 3 |
| 7 801-11 700 | 4 |
| 11 701-15 600 | 5 |
| 15 601-19 500 | 7 |
| Above 19 500 | 9 |

In that year, Juma was earning a basic salary of sh. 21,000 per month. In addition, he was entitled to a house allowance of sh. 9,000 p.m. and a personal relief of sh. 1,056 p.m.

1. Calculate Juma’s annual pay in K£. (2 marks)
2. Calculate the tax payable by Juma. (5 marks)
3. Juma’s deductions per month were:

Co-operative society contributions sh. 2,000

Loan repayment sh. 2,500

Calculate his net salary per month. (3 marks)

1. Complete the table below for y=2cos x and y=tan x for (2 marks)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 |
| 2cos x |  |  |  |  |  |  |  |  |  |  |  |  |  |
| tan x |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. On the graph paper provided and on the same Cartesian plane plot the waves of y=2cos x and y= tan x for (4 marks)
2. Use the graph to solve the equations:
3. 2Cos x= tan x (1 mark)
4. 2cos x = -0.5 (1 mark)
5. Tan x = 0.3 ( 1 mark)
6. Three towns R,S and T are such that R is 300m from S on a bearing of 300˚ and T is 450m directly south of R
   1. Using a scale of 1cm to represent 60m, draw a diagram to show the position of the towns. (3 marks)
   2. Use the scale drawing to determine:
      1. The distance between T and S in meters (2 marks)
      2. The bearing of T from S. (2 marks)
   3. Calculate the area of RST. (3 marks)
7. Halima deposited Ksh. 109 375 in a financial institution which paid a simple interest at a rate of 8% per annum. At the end of 2 years, she withdrew all the money. She then invested the money in shares. The value of the shares depreciated at 4% per annum in the first year of investment. In the next 3 years, the value of the shares appreciated at 18% per annum.
   1. Calculate the amount Halima invested in shares. (3 marks)
   2. Calculate the value of Halima’s shares:
      1. At the end of the first year. (2 marks)
      2. At the end of the next 3 years. (2 marks)
      3. After the fourth year. (1 mark)
   3. Calculate Halima’s gain from shares as a percentage. (2 marks)