SECTION 1

1.Three points O, A and B are on the same horizontal ground. Point A is 80 metres to the north of O. Point B is located 70 metres on a bearing of 0600 from A. A vertical mast stands at point B. The angle of elevation of the top of the mast from O is 200. Calculate:

1. The distance of B from O. (2mks)
2. The height of the mast in metres. (2mks)

2.Evaluate using logarithms

849.6 × (2.41)2

3 3941 (3mks)

3.There are three brothers in a family. The eldest is 10 years older than the second born, who in turn is five years older than the youngest. The sum of their ages is 68 years. State the age of each brother. (3mks)

4. Manyatta village is 74km North West of Nyangate village. Chamwe village is 42km West of Nyangate. By using an appropriate scale drawing, find the bearing of Chamwe from Manyatta. (3mks

5.Change 0.23... and 3.23... into fractions and hence evaluate

(3mks)

6. Use table of square roots and reciprocals to evaluate the square root of y if

Correct to two decimal places. (3 mks)

7.A line makes an angle of 68.20 with the x axis. Given that the line passes through (-2,3) find the equation of the line in the form y = mx + c. (3 mks)

8.Using a ruler and a pair of compasses only

1. Construct triangle ABC in which C = 8cm, angle ABC = 1050 and BAC = 450 (2mks)
2. Drop a perpendicular from A to meet CB produced at P hence find the area of triangle ABC (2 mks)

9.An artisan has 63 kg of metal of density 7000kg/m3. He intends to use it to make a rectangular pipe with external dimensions 12cm by 15cm and internal dimensions 10cm by 12cm. Calculate the length of the pipe in meters. (4mks)

10.Find the L.C.M of

X2 – xy – 12y2 and x + 3y hence simplify

(3 mks)

11.When a number is increased in the ratio 5:3 and decreased by 20% it becomes 400. Find the number (3mks)

12.Solve for a in 2a + 3b = 59 and 2a+3 – 3b+2 = 13 (3mks)

13 .A regular polygon with 2x + 8 sides has the exterior angle being equal to (3x + 5)0. Calculate the value of x. (3mks)

14.A,B,C,D is a cyclic quadrilateral. The tangent at A meets CD produced at `T’. If angle ATD = 500 and angle ABC = 800,, calculate angle CAD.

15.Simplify the expression

3a2 + 4ab + ab + b2

4a2 + 3ab – b2 (3mks)

16.Two towns P and Q are 400 km apart. A bus left P for Q for one hour and then started the return journey to P. One hour after the departure of the bus from P, a trailer also heading for Q left P. The trailer met the returning bus ¾ of the way from P and Q. They met t hours after the departure of the bus from P.

1. Express the average speed of the trailer in terms of t. (1mk)
2. Find the ratio of the speed of the bus to that of the trailer. (2mks)

SECTION 2

17.Three people A,B and C work together to make a certain number of tins. If person `C’ was to work alone, he will take 4 4/9 hours to complete the job. If all are working together; they would be taking 1hr 40mins to complete the job. They all started working together however person `B ’left after the first 40mins, while person `C’ left 20mins later. Person À’ took a further 1hr 46mins.

Calculate how long it would take if all the tins were

made by

1. Person À’ alone?
2. Person `B’ alone?
3. Persons À’ and `C’ alone

18A (-2,-4), B (x,v), C (3,1) and D (a,b) are vertices of a rhombus.

AB has gradient of 2/3 and BC has a gradient of 3/2.

1. Determine by calculation the coordinates of B (3mks)
2. Using vector method calculate the coordinates of D (2mks)
3. Calculate the lengths of diagonals AC and BD (2mks)
4. Hence or otherwise calculate the area of the rhombus to the nearest 2 significant figures. (3mks)

19.The figure below shows a cone with a vertex at A and diameter 13cm. The cone is cut off along DE as shown below;

Find

1. The vertical height AO (2mks)
2. Find the curved surface area of the frustrum (4mks)
3. Find the volume of the frustrum. (4mks)

20. In this question use a scale of -8 and -13

Using a graph, draw quadrilateral ABCD with A (8,2), B (7,5) C (4, 3) and D (5, 1). Draw ABCD. (1 mk)

Under a certain enlargement D is mapped onto D`(2, -5) and A is mapped onto A`(-4, -7). Mark points A and D`and hence locate the centre of enlargement and hence complete A`B`C`D`. (3mks)

State the Linear Scale Factor. (1 mk)

Quadrilateral A`B`C`D` is further enlarged to A” B”C”D” is mapped to A”(-5 ½ ,1) and C`is mapped onto C”(-2 ½ ,0). Mark points A”and C”and locate the centre of enlargement that will map A`B`C`D onto A”B”C”D”hence complete figure A”B”C”D”. (3mks)

Describe fully the transformation that will map ABCD onto A”B”C”D” (2mks)

1. An amount of money was shared among five siblings, John, James, Jacob, June and Janet. John got 3/8 of the total amount while James got 2/5 of the remainder. The remaining amount was shared equally among Jacob, Jane and Janet, each of which received 1200 Kshs.
2. How much did James get? (3mks)
3. How much was shared among the five siblings?
4. John, James and Janet invested their money and earned a profit of Ksh.2400. A 1/3 of the profit was left to maintain the business and the rest shared according to their investments. Calculate how much each got. (5mks)
5. (a) Juma has two similar plots of lland. Their lengths are (5x + 1)m and (x + 1)m respectively, while their widths are 4x and x metres respectively. Find x, and hence the dimension of the plots. (3mks)

(b) The plots are to be fenced with posts at every corner and those on the sides are spaced at an interval of 4m. If each post cost 50 shillings how much will he spent to buy post enough for the two plots. (3mks)

(c) A fencing wire costs 15 shillings per meter and he wishes to have the wire go round three times each plot. How much will he spent on the wire? (4mks)

23A bus left Mombasa and travelled towards Nairobi at an average speed of 60km/h. After 21/2 hours, a car left Mombasa and travelled along the same road at an average speed of 100km/h. If the distance between Mombasa and Nairobi is 500km, determine

{a} {i} the distance of the bus from Nairobi when the car took off. (2mks}

{ii} the distance the car travelled to catch up with the bus.

{4mks}

{b} Immediately the car caught up with the bus, the car stopped for 25 minutes. Find the new average speed at which the car travelled in order to reach Nairobi at the same time as the bus. {4mks}

2 4.The marked price of a certain article is x% of the cost price. If a cash discount of 5% off the marked price is given.

1. Calculate the value of x if the cost price is sh25,550 and the cash price is shs57283.10. (3mks)
2. Calculate the overall % profit (2mks)
3. A trader bought 25 similar articles at the above stated cost price, 5 of them were found to be defective. He sold the rest with new marked price per item but with same 5% cash discount as before. By doing so the same expected profit % in (b) above was made on the 25 articles. Calculate the new marked price per article. (3mks)
4. The new marked price for the items sold in c) above will therefore read, Y% above cost. Find Y. (2mks)

25.The figure below shows a circle with centre O. CPT is a tangent to the circle at P and chord AB produced meets the tangent at P. ‹BPT = 470, AB = 4.5cm, PB = 3.6cm and BT = 8cm

Calculate

1. The length of PT (2mks)
2. The length of the radius of the circle (3mks)
3. The area of the shaded region (5mks)