## NUMERICAL CONCEPTS

1. (a) Given that a * b = $\frac{5a-4b}{4}$, evaluate; 4 * (4 * 2)

   (b) Make b the subject of the formula $p = \frac{c^2}{3a-b}$ and hence find b if $a = 10, c = 2$ and $p = 22$

   (c) Solve the equation $\frac{p-3}{2} - \frac{2p-3}{5} = \frac{1}{4}$

   (d) Factorize:

   (i) $1 - xy - x^2 - y$ completely

   (ii) $(y+1)^2 - 25 - 10y - y^2$ completely

## INDICES, LOGARITHMS AND SURDS

2. (i) Simplify $\frac{\sqrt{180} \times 10^3}{10^2 \times \sqrt{45}}$ Expressing your answer in scientific notation.

   (ii) Use tables to evaluate $\sqrt{\frac{0.043 \times 22.5}{16.8}}$

   (iii) Rationalize $\frac{\sqrt{2} - 2\sqrt{5}}{\sqrt{5} + \sqrt{2}}$ the denominator

   (iv) Solve the equation $\log_{10} 15x - \log_{10}(3x+4) = 1$

   (v) Simply $(32)^{\frac{1}{2}} \times \left(\frac{4}{3}\right)^{-2}$

## EQUATIONS OF STRAIGHT LINES

3. (a) Determine the equation of the line;

   (i) Passing through two points (-4, 2) and (5, 3)

   (ii) Passing through the point (1, 4) with gradient $\frac{2}{3}$

   (iii) With gradient $\frac{1}{2}$ and $y$ - intercept of 5

   (b) Find the equation of the line that is parallel to $y = -2x + 5$ and passing through $(-2, 3)$

   (c) Find the equation of the line that is perpendicular to $-2x + 5y - 14 = 0$ and passing through (-1, -5)

   (d) Find the equation of the line which is perpendicular to the bisector of the two points (3, -2) and (5,4)

## ALGEBRA

4. Given that $x^2 - y^2 = 135$ and $x - y = 9$; find the value of $x$ and $y$

5. Jane bought 3 pencils and 4 books at a total cost of 4900/= Tom bought 5 pencils and 6 books at a total cost of 7500/=. Determine the price of each pen and each book.

6. (a) Juma is twice as old as Sarah. Apio is 6 years younger than Juma. If the sum of their ages is 29, Find;
   (i) An algebraic expression for the sum of their ages.
   (ii) The age of each person.

   (b) James is $(x+3)$ years old now. His brother, Peter is 5 years younger but her sister, Annette is twice as old as James. The sum of the ages of the two boys is 29. Find Annette's age.

   (c) Given that $x = 2 + \sqrt{3}$, find the value of $\left(x + \frac{1}{x}\right)$.

   (d) The hypotenuse of a right angled triangle is of length $(m^2 + n^2)$. Given that one of the other sides is $(m^2 - n^2)$ in length, determine the length, $l$ of the third side hence find $l$ when m = 16 and n = 15

## BUSINESS MATHEMATICS

7. (a) The marked price of a T.V is shs. 900,000. A dealer charges 20% more under hire purchase. If the deposit is Shs. 280,000/=, calculate the amount of monthly installments if there are 8 equal installments.

   (b) (i) A certain amount of money was invested for 4 years at a rate of 5% per annum simple interest. If the interest was 400,000/=, find the amount that was invested.

   (ii) For 4 years at a rate of 5% per annum for compound interest. If the interest was Shs.107753.125, find the amount that was invested.

   (c) A car costing Shs. 15,000,000 depreciates in value at a rate of 10% every 6 months. Find its value after 1 ½ years.

   (d) The income tax rates of a certain country is as follows;

| Taxable income (Shs.) | Tax rate (%) |
|---|---|
| 0 – 335,000 | 0 |
| 335,001 – 450,000 | 10 |
| 450,001 – 650,000 | 30 |
| Above 650,000 | 45 |

The tax system is that tax rates is on Basic salary and consolidated allowances as shown below.

(i) If the Basic monthly income of an employee is Shs. 480,000 plus Shs. 250,000 as consolidated allowances. Calculate the income tax paid.

(ii) Find the basic income if the consolidated allowance was Shs. 250,000 and a man paid Shs. 386,500 as tax.

(e) Tugume is a commission agent of a certain country. He earns a basic salary of Shs. 300,000 per month plus a 10% commission on every item sold. If he received a monthly salary of Shs. 390,000/= and each item was sold at Shs. 150,000, how many items were sold by Tugume that month?

(f) The table below shows the income tax rates of government employees. This is applied after allowances have already been deducted.

| Taxable monthly income | Tax rate (%) |
|---|---|
| 0 – 235,000 | Free |
| 235,001 – 335,000 | 10 |
| 335,001 – 410,000 | 20 |
| 410,001 – 650,000 | 30 |
| Above 650,000 | 35 |

An employee has a gross monthly income of Shs. 670,000 and is entitled to the following allowances:

- ✓ Marriage allowance — Shs. 720,000 per annum
- ✓ Housing allowance — 10% of the gross monthly income
- ✓ Medical care — Shs. 20,000 per month
- ✓ Family allowance — Shs. 50,000 per month

Calculate the;

(i) Monthly income tax payable

(ii) Net monthly income

## STATISTICS AND PROBABILITY

8. (a) (i) The mean age of 5 students in a class is 18 years. The ages of four students are 15, 19, 16 and 17 years. Find the age of the fifth student.

(ii) The table below shows the ages of men in the village.

| Ages | 20 – 22 | 23 – 25 | 26 – 28 | 29 – 31 | 32 – 34 |
|---|---|---|---|---|---|
| Number of men | 3 | n | 2 | 9 | 2 |

Given that the modal class is 26 – 28 and that the mode is 27.5 years, find the value of n

(iii) A basket contains 8 mangoes and 7 tomatoes. If two fruits are selected at random without replacement, find the probability that the two fruits selected are mangoes.

(b) The O-give curve below shows marks obtained by the students of S.4 in a mathematics test.

(i) Use the O-give to estimate the median mark

(ii) If the pass mark was 35.5%, how many students passed the test?

(iii) Draw a frequency distribution table and use it to calculate the mean score

(iv) Draw a histogram and use it to determine the modal mark.

(c) The table below shows weights of babies in a certain hospital in kilograms.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6.5 | 5.1 | 11.2 | 4.7 | 5.7 | 6.2 | 6.4 | 4.4 | 6.5 |
| 1.1 | 6.1 | 8.4 | 4.8 | 7.9 | 9.2 | 4.9 | 5.9 | 8.1 |
| 8.9 | 7.6 | 3.6 | 5.1 | 5.1 | 6.3 | 8.3 | 7.8 | 6.9 |
| 9.2 | 6.6 | 9.0 | 4.2 | 8.3 | 12.1 | 6.5 | 8.1 | 13.7 |
| 2.3 | 8.4 | 4.3 | 7.3 | 5.8 | 7.5 | 7.8 | 6.1 | 11.7 |
| 4.1 | 8.1 | 1.5 | 9.1 | 8.0 | 4.9 | 10.2 | 7.2 | 6.3 |

(i) Construct A grouped frequency distribution table of these weights using classes 1.0 – 1.9, 2.0 – 2.9, up to 13.0 – 13.9

(ii) State the class width and using a working mean of 6.45, calculate the mean weight and median weight.

**9.** (a)The probability that student A will pass a mathematics test is $^3/_5$, the probability that a student B will pass the same test is $^2/_3$.

Determine the probability that;

(i) Student A will pass the test and student B fails it.

(ii) At least one student passes the test

(iii) At most one student passes the test.

(b) Two dice are tossed and the product of the number that appears upper most is recorded in the table below.

| × | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | 10 | | | | |
| 6 | | | | | 30 | |

(i) Copy and complete the table

(ii) Find the probability that the product is a multiple of 5

(iii) Find the probability that the product is a triangular number

## SCALES, RATIOS, PROPORTIONS AND VARIATIONS

**10.** (a) Given that $y$ is inversely proportional to the square root of x and $x = 4$ when $y = 2$. Find $y$ when $x = 144$.

(b) Given that $p:q = 5:3$, Find the simplest form the ratio of $(3p - q):(3p + 2q)$

(c) if $x:y = 4:3$ and $y:z = 5:4$. Find the ratio $x:y:z$.

(d) 12 taps can fill a school tank in 4 hours. How long would it take 8 taps to fill the same tank if opened together simultaneously?

(e) A school has a land which covers 7.2 $cm^2$ on a map whose scale is 1:40,000. Find the area of the land owned by the school in $km^2$

(f) A birthday cake is in a shape of cuboid 10 cm long, 6 cm wide and 4 cm high. The cake is packed in a similar box 24 cm wide. Calculate the surface area of the box.

(g) P is partly constant and partly varies directly as the square of $r$. Given that $P = 40$ when $r = 3$ and $P = 72$ when $r = 5$. Find the value of $P$ when $r = 8$.

**11.** (a) Musiime wanted to buy x kg of sugar and y kg of salt, The total mass of sugar and salt was at least 10kg. The cost of sugar was Shs. 3000/= per kilogram while that of salt was Shs. 2000/= per kilogram. He intends to buy at least more salt than sugar and he had only Shs. 30,000/= to spend.

(i) Write down three inequalities to represent the given information

(ii) Represent the inequalities above on a graph

(iii) Find the maximum quantity of each commodity Musiime bought and how much money he spent.

**12.** (a) A Canter lorry leaves Town A at speed of 60 $kmhr^{-1}$ and at the same time, Premio 40 km behind A sets off traveling in the same direction as the lorry moving at a speed of 90$kmhr^{-1}$. Determine the distance from Town A where the Premio over takes the Canter Lorry.

(b) A fast moving coach traveling from Kampala to Arua can move at a speed of 120 $kmhr^{-1}$. Express this speed in meters per second.

(c) Okello and Okoth live in two towns 240 km apart. One day at 9:45am, Okello left his town and drove towards Okoth's town at an average speed of 60 kmhr-1. Okoth left his town at 10:50 am on the same day and drove towards Okello's town at an average speed of 80 $kmhr^{-1}$.

(i) Calculate the;

-Distance from Okello's town to the place where the two met.

-Time they met.

(ii) If the two continued each with their respective journeys until each reached his destination, determine who reached earlier and by how long.

**13.** At 11:00am, acylist left kampala for Masaka, 120km away at an average speed of 20kmhr-1. After 3hours, he rested for an hour. He then continued to Masaka at the same speed. At the same time, a motorist left Masaka for Kampala at an average speed of 60kmhr-1 and stayed in Kampala for 1 ½ hours before returning to Masaka at an average speed which took him back to Masaka in 2 ½ hours.

(a) On the same axes, using a scale of 1cm to represent 5km on the vertical axis and 2cm to represent 1 hour on the horizontal axis, draw a distance-time graph for the cyclist and the motorist.

(b) From your graph in (a) above, determine;

(i) The time and distance from Kampala at which the motorist med and by passed the cyclist on this way to and from Kampala respectively.

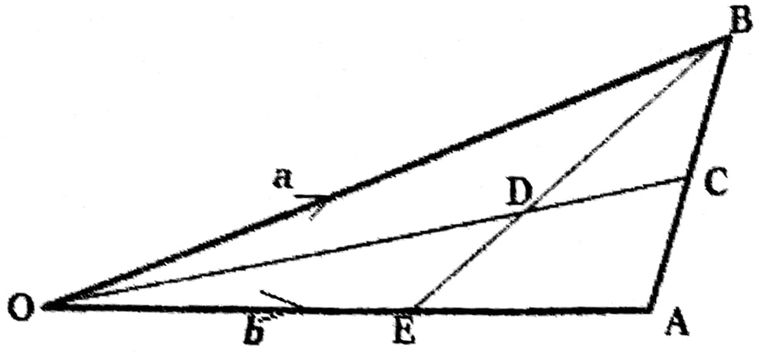
(ii) How long did the motorist have to wait in Maska before the cyclist could arrive?

**14.** (a) ABCD is a parallelogram where A(2,1), B(3,4) and C(1,2).

(i) Find the column vector $\boldsymbol{BA}$ and coordinates of D

(ii) Determine the length of $\boldsymbol{AC}$

(b) .




C divides $\boldsymbol{AB}$ in the ratio 1:2. D divides $\boldsymbol{OC}$ in the ratio 3:2. $\boldsymbol{OB} = \boldsymbol{b}$ and $\boldsymbol{OA} = \boldsymbol{a}$.

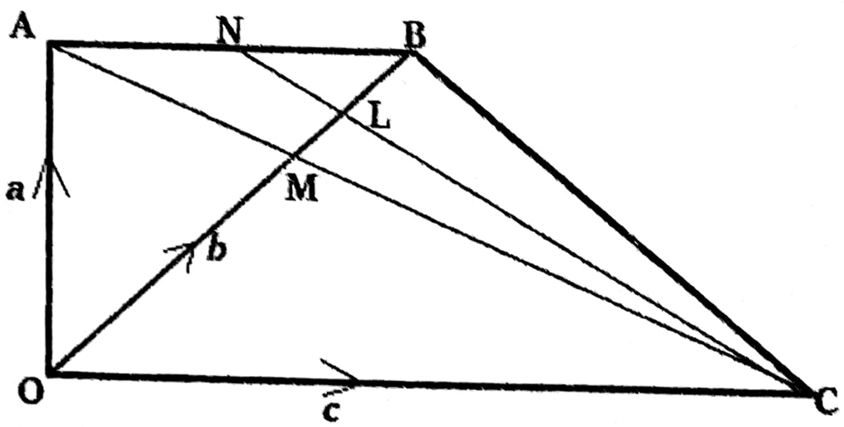
Find;

(i) $\boldsymbol{AB}$, $\boldsymbol{AC}$, $\boldsymbol{BD}$ in terms of $\boldsymbol{a}$ and $\boldsymbol{b}$

(ii) Show that the points E, D and C are collinear if E is the mid-point of $\boldsymbol{OA}$.

(iii) The ratio of BD:DE

(c)




If A, B and C have position vectors a, b, and c. AM: MC = 2:1, AN:NB = 2:1.

(i) Show that BM = $\frac{1}{3}\boldsymbol{a} + \frac{2}{3}\boldsymbol{c} - \boldsymbol{b}$

(ii) the lines BM and CN intersect at L. Given that BN = $k$LM and CL = $t$CN, where $k$ and $t$ are scalars. Express BL and CL interms of $k, t, a, b,$ and $c$

(iii) Hence by using triangle ALD or otherwise determine the values of $\boldsymbol{k}$ and $\boldsymbol{t}$.

## TRANSFORMATIONS

**15.** (a)Find the co-ordinates of the image of point $A(-3,-2)$ after a rotation about the origin through -90°

(b) Under a transformation whose matrix is $\begin{pmatrix} x-1 & 2 \\ -x & 3 \end{pmatrix}$. A figure whose area is 3cm$^2$ is mapped onto a figure of area 36cm$^2$. Find the value of $x$.

(c) Given that the unit square OIKJ with vertices $O(0,0), I(1,0), K(1,1)$ and $J(0,1)$ is mapped onto $O'(0,0), I'(4,0), K'(4,4)$ *and* $J'(0,4)$. By matrix transformation, determine the matrix of transformation using I and J.

(d) Find the image of $M(-5,2), N(-2,2)$ and $P(-3,4)$ under a transformation $R = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

(i) Plot and label triangle MNP and its image M'N'P'

(ii) Describe the transformation R

(iii) M''N''P'' is image of M'N'P' under the transformation $T = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$. Find the coordinates of $M'', N''$ *and* $P''$

**16.** (a) (i) An object with area = 30cm2, is mapped onto an image by the transformation matrix $\begin{pmatrix} 5 & -1 \\ 2 & 1 \end{pmatrix}$, find the area of the image.

(ii) The image of triangle X(2, 1), Y(4, 1) and Z(3, 4) under transformation T is X'(-1, 2), Y'(-1, 4) and Z'(-4, 3). Find the matrix T and fully describe it.

(iii) Triangle X'Y'Z' is then mapped onto X''Y''Z'' after a reflection in the line $y + x = 0$. Find coordinates of X''Y''Z''.

(b) Determine;

(i) A single matrix that maps XYZ onto X''Y''Z''.

(ii) A single matrix that maps X''Y''Z'' back to XYZ

**17.** (a) Given that $f(x) = px + 2, g(x) = x + 2$

(i) If $fg(x) = 3x + 8$, determine the value of $p$

(i) Find $f^{-1}(8)$

(b) If function f(x) denotes the smallest prime factor of a number less than 5, if the domain is {6,8,9}, find the range

(c) In the functions $g(x) = 1 - 3x$ and $f(x) = \frac{1}{x-1}$, find;

(i) $g^2(x)$

(ii) $x$ where $g^2(x) = 7$

(d) The functions f and h are such that $f(x) = ax^2 + b$ and $h(x) = 2x$. Given that $f(1) = 3$ and $f(2) = 0$;

Find;

(i) The value of a and b

(ii) The values of x given that $f(x) = 3x$

(iii) $hf(x)$

(iv) $x$ when $hf(x) = fh(x)$

## GEOMETRY OF 2-D FIGURES

**18.** A plane flies from airport P on a bearing of 000° from 300km to airport R. From R it flew to airport T, 650km on a bearing of 060°. From T it finally flew to airport S on a bearing of 135°.

(i) Draw a diagram to show the routes taken by the plane

(ii) Calculate the distance from R to S using the shortest route.

(iii) Determine the bearing of airport T from P and the bearing of airport S from P.

**19.** (a) ABCD is a quadrilateral with triangle $BAC = 30°$ and $ACD = 135°$. AC = 7.2cm, CD = 4.8cm and AB = 8.4cm. Using a pair of compasses and a ruler only; construct the figure ABCD.

(b) AC is produced, construct a perpendicular from D to meet AC at T, hence measure CT.

(c) Construct a circumcircle CDT and measure the radius of the circle.

## TRIGONOMETRY

**20.** (a) Building T is 400m high. The angle of depression of the top of a building R from the top of T is 28°, if the two buildings are 100m apart, find the height of building R. (Give your answer to 2 dp).

(b) Given that $\sqrt{3}\tan\theta - 1 = 0$ for $180° \leq \theta \leq 270°$, Find the exact value of $\frac{4}{\sin\theta} - \frac{2\sqrt{3}}{\cos\theta}$ without using tables or calculators.

(c) Without using tables or calculators, Find the exact value of ;

(i) $\frac{\cos 30°}{\sin 30°}$

(ii) $\sin 45° \cos 60° + \cos 45° \sin 60°$

(d) Given that $\cos\theta = -0.8$ where $\theta$ lies between $180°$ *and* $360°$

Find; $\tan\theta + \sin^2\theta$.

(e) Plot a graph of $y = 2\cos 3\theta$ *for* $0° \leq \theta \leq 180°$. Use it to determine the values of $\theta$ when $2\cos 3\theta = 0.500$ and $2\cos 3\theta = -0.866$

## MATRICES

**21.** (a) Given that matrix $\boldsymbol{P} = \begin{pmatrix} -5 & 6 \\ -2 & 2 \end{pmatrix}$, find $P^2$

(b) If $\begin{pmatrix} 4 & 1 \\ x & -1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ 8 \end{pmatrix}$, determine the values of $x$ and $y$.

(c) Find the inverse of $\begin{pmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{-1}{2} & \frac{-1}{2} \end{pmatrix}$

(d) Use matrix method to solve the following equations

$$4x - 14 = -5y$$
$$-2y + 3x = -1$$

(e) Given that A = $\begin{pmatrix} 3x & x-6 \\ -6 & x+2 \end{pmatrix}$ is a singular matrix, determine the values of $x$

(f) (i) If A = $\begin{pmatrix} -2 & 4 \\ -3 & 3 \end{pmatrix}$ and AB = $\begin{pmatrix} 6 & 0 \\ 0 & 6 \end{pmatrix}$, find the matrix B.

(ii) C = $\begin{pmatrix} 1 & -4 \\ 2 & 0 \end{pmatrix}$ and D = $\begin{pmatrix} 3 & -1 \\ 2 & -5 \end{pmatrix}$, find $(CD)^{-1}$

**22.** The seats in a stadium are graded as first, second or third class. The categories of people who go to watch the matches are filled as below. First class seats were occupied by 1500 children, 2000 adults, second class seats were occupied by 3000 children and 2500 adults respectively while third class where occupied by 500 children and 1800 adults. First class children and adults pay Shs. 2000 and Shs. 2500 respectively, second class Shs. 1000 and Shs. 1500 respectively, while third class children and adults pay Shs. 500 and 1000 respectively.

(a) Form a 1x3 matrix to show how the three classes of seats were filled by;

(i) Children

(ii) Adults

(b) Use matrix multiplication to obtain the collections by the stadium manager from;

(i) Children only

(ii) Adults only

(c) Hence obtain the total collections by the stadium managers from the match that day.

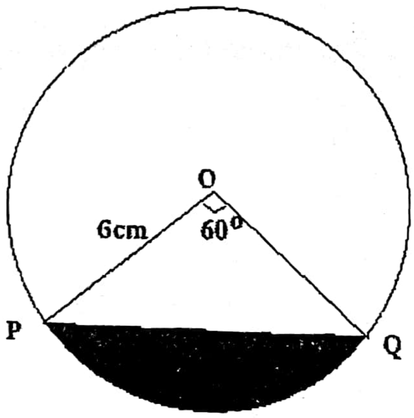
## CIRCLES AND CIRCLE PROPERTIES

**23.** AB is a chord of a circle centre O. If AB = 5cm, and the radius of the circle is 8cm, calculate;

(i) $< AOB$

(ii) The area of the triangle AOB

**24.** (a) The figure below shows a chord PQ which subtends an angle of $60°$ at the centre, O.

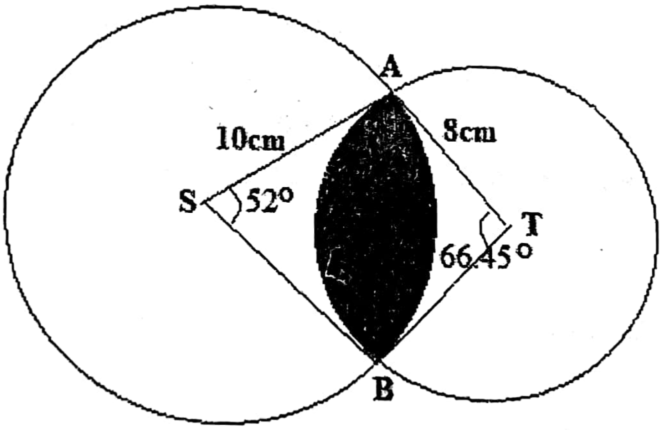



Find the

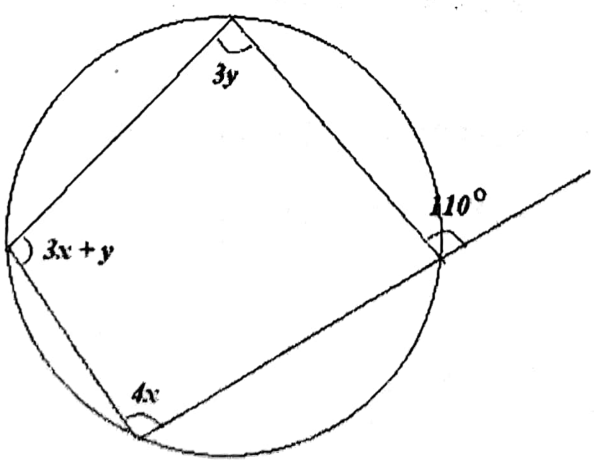
(i) area of the sector POQ.

(ii) Area of the shaded segment bounded by the chord PQ and the minor arc PQ (Use $\pi = 3.14$)

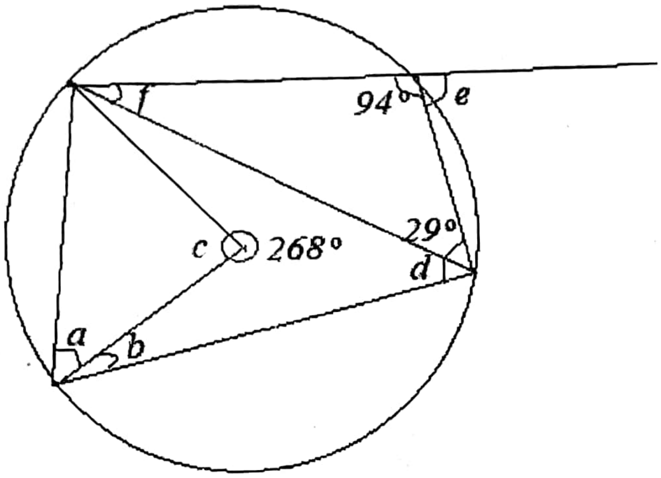
(b) The figure below shows intersecting circles with centres S and T. The radii of the two circles are 10cm and 8cm respectively. $< ASB = 52°$ *and* $< ATB = 66.5°$. Find the area of the shaded region.



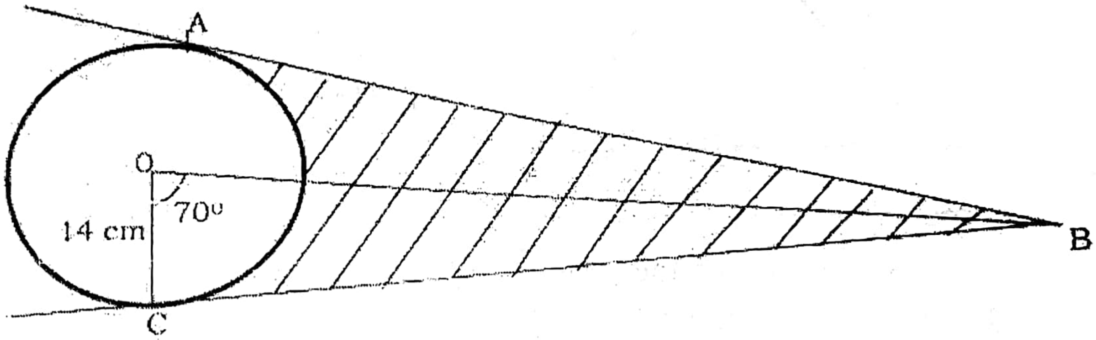

(c) Find the values of x and y in the figure below.



(c) Determine the marked angles in the figure below




(d) In the figure below, BC and BA are tangent to the circle centre O. If OC = 14cm and angle COB = 70°

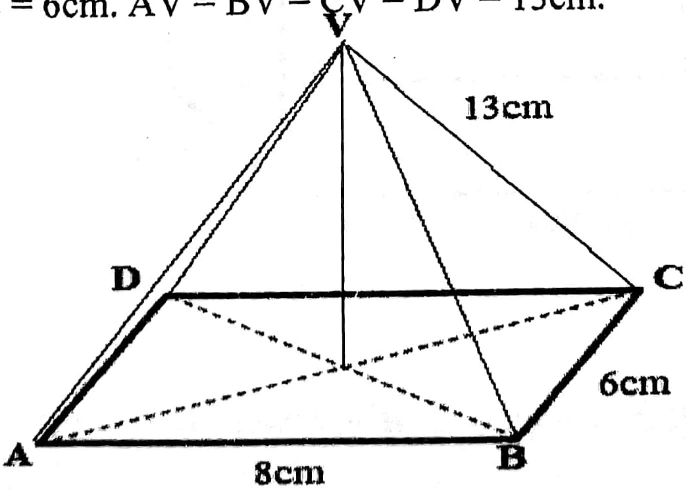



Calculate the area of the shaded region. [take $\pi = \frac{22}{7}$]

(e) If one interior angle of a polygon is 80° and the other interior angles area ll equal to 115°. Determine the number of sides the polygon has.

## 3D – GEOMETRY

**25.** The figure below is a right pyramid ABCDV with a rectangular base ABCD. AB = 8cm, BC = 6cm. AV = BV = CV = DV = 13cm.



Determine the;

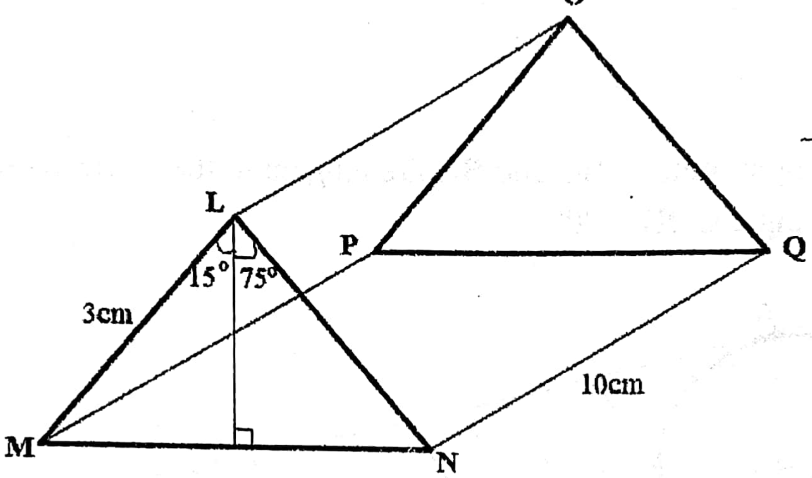
(i) Height of the pyramid

(ii) Angle between the line AV and the base

(iii) Angle between the plane VBC and the base

(iv) Angle between two opposite faces of the pyramid.

**26.** The diagram below shows a triangular prism LMNOPQ of length 10cm and endge LM = 3cm. LX is perpendicular to MN such that $< MLX = 15°$ and $< MLN = 85°$.



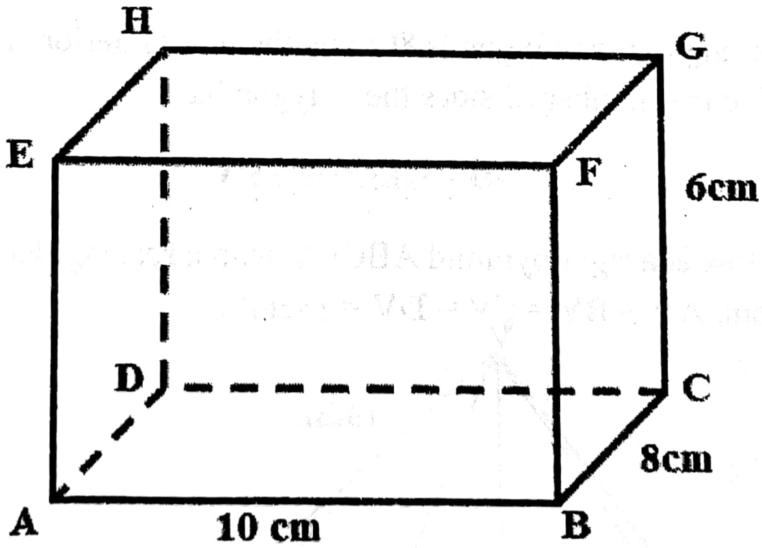

Find the ;

(i) Volume of the prism

(ii) Angle between LM and the base

(iii) Angle between MLOP and LONQ

**27.** The diagram shows a cuboid ABCDEFGH in which AB = 12cm, BC = 8cm and CG = 6cm.




(a) Calculate the lengths;

(i) AC

(ii) AG to 4 significant figures.

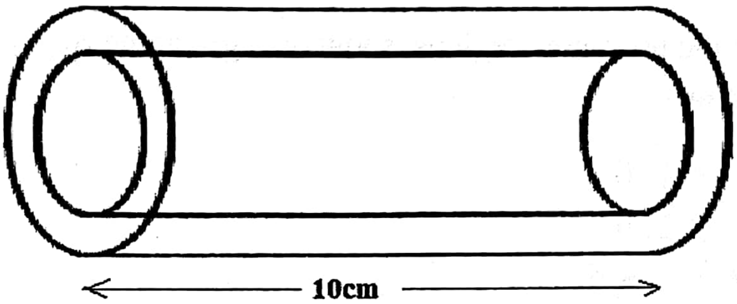
(b) Determine the angle between;

(i) Line AG and the base ABCD

(ii) Plane DCFE and plane EFGH

## MENSURATION

**28.** (a) The figure below shows a cylindrical water main which is 10cm long. The pipe has an inner radius of 30 cm and an outer radius of 37cm.



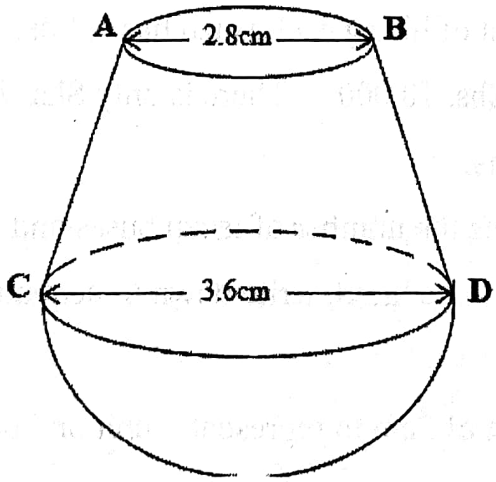

Determine the;

(i) Total surface area of the pipe

(ii) Volume of the pipe [Take $\pi = 3.14$]

**29.** The height of a cone is 12 cm and the angle at the vertex of the cone is 30°. Find the surface area of the cone. [Take $\pi = 3.14$]

**30.** The diagram blow shows a tank for storing water, consisting of a frustum cone fastened to a hemisphere. AB = 2.8 m and CD = 3.6 m The perpendicular height between AB and CD is 2.1m.




Calculate the volume of the water in the tank when full, giving your answer to the nearest $m^3$.

# LINEAR PROGRAMMING AND INEQUALITIES

**31.** (a) Solve the following inequalities;

(i) $\frac{1}{2}(x-2) \geq 6 + x$

(ii) $x^2 - 3x - 4 \leq 0$

(iii) $3 \geq \frac{7-x}{2} \geq 1$

(b) By shading the unwanted regions, show on a graph the region satisfying the inequalities below.

(i) $x \geq 0$

(ii) $y \geq 0$

(iii) $x + y \leq 6$

(iv) $x + 2y \leq 8$

(f) Use your graph to find the values of x and y which give the maximum values for both $x + y$ and $x + 2y$

(g) Mr. Kiyingi has organized an agricultural study tour for 234 students of JONAS. Two types of vehicles are available for hire. Isuzu buses and Fuso Omni-buses. The capacity of each Isuzu bus 65 passengers while that of each Fuso Omni-bus is 26 passengers. The number of Fuso Omni-buses will be more that the number of Isuzu buses. The number of Fuso Omni-buses will be less than 6. The cost of hiring each Isuzu bus is Shs. 100,000 while that of the Fuso Omni-bus is Shs. 70,000/=. There is only Shs. 700,000 available for transporting students.

(i) If x represents the number of Isuzu buses and y the number of Fuso Omni-buses to be hired, write down 6 inequalities for the information given.

(ii) Using a scale of 2cm to represent 1 unit on both axes, represent the inequalities on a graph and shade out the unwanted regions.

(iii) Use your graph to find the number of Isuzu buses and Fuso Omni-buses to be ordered so that all the students are transported at a minimum cost.

**32.** Given that Sets A, B, and C contain elements such that;

$n(A)$ 22 $\qquad n(A' \cap B'C') = 14$

$n(B) = 38 \qquad n(A \cap C) = 12$

$n(C) = 32 \qquad n(B \cap C) = 18$

$n(A \cap B) = 14 \qquad n(A \cap B \cap C) = x$

(a) Represent the above information on a Venn diagram

(b) Find the;

(i) Value of x

(ii) Universal set

(c) Find the probability that an item selected at random belongs to;

(i) Only two of the three sets

(ii) A or B

**33.** Given that; $U = \{x: x \in N, 1 \leq x \leq 14\}$

$A = \{x: x \text{ is an odd number}\}$

$B = \{x: x \text{ is a prime number}\}$

$C = \{x: x \text{ is a multiple of } 3\}$

Find;

(i) $A \cup B$

(ii) $A \cap C'$

(iii) $n(A \cap B)$

**34.** In the S.3 class, 7 like football an d basketball, 6 like basketball and volleyball, 5 like football and volleyball, 8 like none of the three, 12 like volley ball, 16 like either football or basketball but not volley ball. The number for basketball exceeds that for football by 2, 18 students like only one type of games. Taking the number of students that like football to be $y$.

a) Represents the above information on a Venn diagram.

b) Find the probability that a student picked at random likes at least two games

# MUKONO KING'S HIGH SCHOOL

# GRAND MATHEMATICS SEMINAR

# 2023

# ORDINARY LEVEL

1. Numerical Concepts
2. Indices, Logarithms and Surds
3. Equations of a straight line
4. Algebra
5. Business mathematics
6. Statistics and probability
7. Scales, ratios, proportions and variations
8. Kinematics
9. Vectors and translations
10. Transformations
11. Geometry of 2-d figures
12. Trigonometry
13. Matrices
14. Circles and circle properties
15. 3d – geometry
16. Mensuration
17. Linear programming and inequalities
18. Sets