

FORM TWO HOLIDAYS KEYNOTE MATHEMATICS 10 QUESTION PAPERS

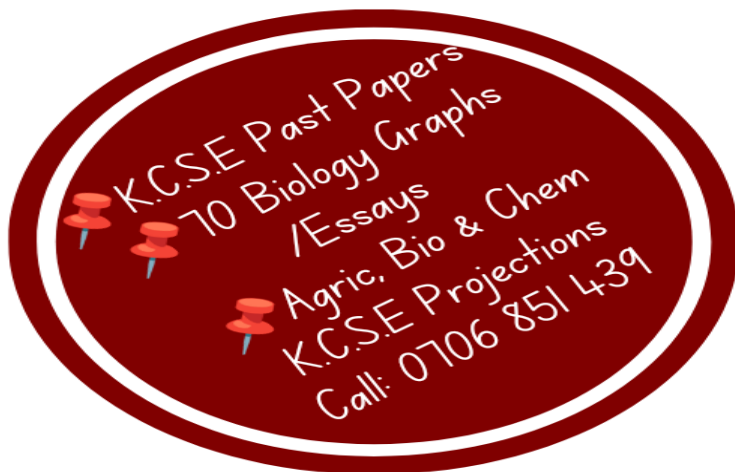


FORM 2 HOLIDAYS KEYNOTE MATHEMATICS TEN QUESTION PAPERS

Prefer Calling Amobi Group of Examiners
@ 0743 333 000 OR 0706 851 439
For Marking Schemes

N/B In Response to the Huge Costs Associated in Coming Up with Such/Similar Resources **Regularly**, We inform us All, **MARKING SCHEMES ARE NOT FREE OF CHARGE**. However Similar **QUESTIONS**, Inform of **soft Copies**, are Absolutely **FREE** to Anybody/Everybody. Hence **NOT FOR SALE**
by Amobi Group of Examiners.

**CALL AMOBI GROUP OF EXAMINERS @
0743 333 000 OR 0706 851 439 TO
ACQUIRE :**



FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 01

SECTION I (50 MARKS)

1. Using mathematical tables; find (4 marks)

$$(0.0546)^{0.5} + (2/4.327)^2$$

2. Solve the equation; (3 marks)

$$\frac{x-2}{3} - \frac{3-x}{4} = \frac{x-2}{2}$$

3. 3g of metal A of density 2.7g/cm³ is mixed with 2.4dm³ of metal B of density 4.8g/cm³. Determine the density of the mixture. (3 marks)

4. Korir is now four times as old as his daughter and six times as old as his son. Twelve years from now, the sum of the ages of his daughter and son will differ from his age by 9 years. Determine present ages. (3marks)

5. Convert 2.2 $\dot{2}\dot{3}$ into an improper fraction. (3 marks)

6. Evaluate $\frac{1}{3}$ of $(2\frac{3}{4} - 5\frac{1}{2}) \times 3\frac{6}{7} \div \frac{9}{4}$ (3 marks)

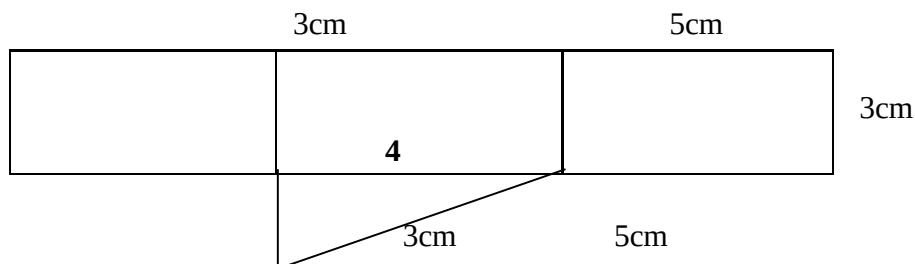
7. Evaluate ; (3 marks)

$$\left(\frac{2}{5}\right)^{-3} \times \left(\frac{4}{5}\right)^2 \times (32)^{2/5}$$

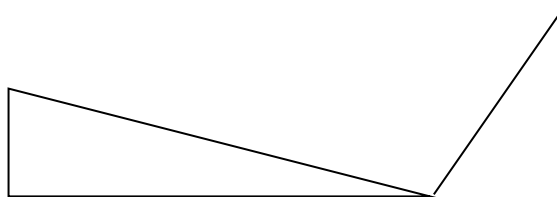
8. Cynthia exchanged Ksh.600,000 to Sterling pounds. After settling the bills worth £1200, she changed the balance to Euros. She then purchased goods worthy 200 Euros. Using the exchange rates below, calculate her balance in Kenyan shillings. (3 marks)

	Buying (Ksh)	Selling (Ksh)
1 Sterling pound	114.20	114.50
1 Euro	101.20	101.30

9. Find the equation of line whose gradient is $-\frac{3}{2}$ and y – intercept is 2. Give the answer in the form $y = mx + c$. **(4 marks)**
10. In a month of March a motorbike salesman sold 3 motorbikes, one at Kshs 150,000, the second at Kshs 120,000 and the other Kshs 100,000. If he is paid a salary of Ksh 15,000 and a commission of 10% how much did he get during the month of March? **(3 marks)**
11. A cylindrical tank has a diameter of 700cm and can hold 120,000l of water. What is the height of the water tank in meters to four significant figures? (Take $\pi = \frac{22}{7}$) **(3 marks)**
12. Two similar solids weigh 625g and 40g respectively. If the surface area of the smaller solid is 4.8cm^2 . Determine the surface area of the larger one. **(3 marks)**
13. Evaluate $\frac{-10 - (-6) \times (-6) \div -2 + (-18)}{-8 + (-6) \div (-2) \times 2}$ **(3 marks)**
14. The figure below shows the sketch of a net of a solid (measurement in centimeters)



Below is part of a sketch of the solid whose net is shown above. Complete the sketch of the solid showing the hidden edges with broken lines. **(4 marks)**



15. Given that $(5m - 2n) : (2m - n) = 7 : 5$. Find the ratio $m : n$. (2 marks)

16. The size of an exterior angle is $\frac{1}{3}$ of the interior angle of a regular polygon.
Determine the number of sides of the polygon. (3 marks)

SECTION II (50 MARKS)

17. Ariell is a sales executive earning a salary of Kshs. 20,000 and a commission of 8% for the sales excess of Kshs. 100,000. If in May he earned a total of Kshs, 48,000 in salaries and commission

a. Determine the amount of sales he made in that month. (4 marks)

b. If the total sales in the months of June and July increased by 18% and then dropped by 30% respectively. Calculate.

i. Ariell's commission in the month of June. (3 marks)

ii. His total earnings in the month of July. (3 marks)

18. Town B is 20km $N60^{\circ}W$ from village A. Town B is 25km 040° from town C. Village D is due East of town C and due South of village A

(a) Using a scale 1:500,000 draw a diagram showing a relative position of town B, town C, village A and village D (4 marks)

(b) Determine;

(i) Distance between village A and town C (2 marks)

(ii) Distance between town C and village D (2 marks)

(iii) Compass bearing of town C from village A (1 mark)

(iv) Compass bearing of village D from town B (1 mark)

19. A Rhombus has its vertices as PQRS. The co-ordinates of the vertex P and Q of the rhombus are P(-1, 3) and Q(2, 4). The diagonal QS and PR meet at point M. Given that the equation of the line PR is $y = x + 4$.

- a)** Find the equation of the diagonal QS. **(1 mark)**
- b)** Find the co-ordinates of the mid-point M of QS. **(2 marks)**
- c)** Find the co-ordinates of the points R and S. **(4 marks)**
- d)** Calculate the length of diagonal PR. **(3 marks)**

20. A triangle has vertices A(-4, -1), B(-1, -3), C(-2, -1).

- a)** Draw triangle ABC on the graph below. **(1 mark)**
- b)** Plot the image $A^1B^1C^1$ of triangle ABC under reflection in the line $y = -x$. **(3 marks)**
- c)** Plot the image $A^{11}B^{11}C^{11}$ of triangle $A^1B^1C^1$ under rotation of $+90^\circ$ about the origin. **(3 marks)**
- d)** Plot the image $A^{111}B^{111}C^{111}$ of $A^{11}B^{11}C^{11}$ under enlargement scale factor -2 and centre (1, 0). **(3 marks)**

21. The ratio of men to women in a self-help group is 8:13. Two more men joined the group while 5 women left it. The new ratio of men to women in the group is 7:10.

- a)** Find the original:
 - i) Number of men in the group **(4 marks)**
 - ii) Number of women in the group **(2 marks)**
 - iii) Original number of members in the group. **(2 marks)**
- b)** Determine the new number of members in the group. **(2 marks)**

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 02

SECTION I (50 MARKS)

Answer all the questions from this section

1. Work out the following, giving the answer as a mixed number in its simplest form

$$\frac{2}{5} \div \frac{1}{2} \text{ of } \frac{4}{9} - 1\frac{1}{10}$$
$$\frac{1}{8} - \frac{1}{6} \times \frac{3}{8}$$

(3marks)

2. When a certain number is divided by 30, 45, 54, there is always a remainder of 21.

Find the least numbers.

(3marks)

3. Evaluate without using mathematical tables of a calculator,

$$\frac{0.0084 \times 1.23 \times 3.5}{2.87 \times 0.056}$$

expressing your answer as a single fraction.

(3marks)

4. Use logarithm to solve tables to evaluate

$$\sqrt[3]{\frac{45.3 \times 0.00697}{0.534}}$$

(4 marks)

5. If each interior angle of a regular polygon is 150° , how many sides does the polygon have?

(3 marks)

6. Solve for x in the equation

$$32^{(x-3)} \div 8^{(x-4)} = 64 \div 2^x$$

(3 marks)

7. Use reciprocal table to work out.

$$\frac{7}{0.5283} + \frac{0.5}{3.735}$$

(4marks)

8. Three pens and four exercise books cost sh. 87. Two pens and five exercise books cost sh. 93.

Find the cost of one pen and one exercise book.

(3marks)

9. A Kenyan Company received US dollars 100,000. The money was converted into Kenya Shillings in a bank which buys and sell foreign Currencies as shown below.

	Buying (kshs)	Selling (ksh)
1 US Dollar	77.25	77.44
1 sterling pound	119.93	120

- a) Calculate the amount of money in ksh, the Company received. **(1mark)**
 b) The company charged the Kenya shillings calculated above into sterling pounds to buy Car in Britain. Calculate the cost of the car to the nearest sterling pounds. **(2marks)**

10. A company saleslady sold goods worth sh. 1,600,000. From this sale she earned a commission of sh. 40,000.

- a) Calculate the rate of Commission. **(1mark)**
 b) If she sold goods whose marked price was sh. 3 600,000 and allowed a discount of 2%, calculate the amount of commission she received. **(2marks)**

11. A piece of metal has a volume of 20cm^3 and a mass of 300g. Calculate the density of the metal in kg/m^3 . **(3marks)**

12. The area of a sector of a circle of diameter 126cm is 4158cm^2 . Calculate the angle subtended at the centre of the circle. (Take $\pi = \frac{22}{7}$) **(3marks)**

13. Simplify completely by factorization. **(3 marks)**

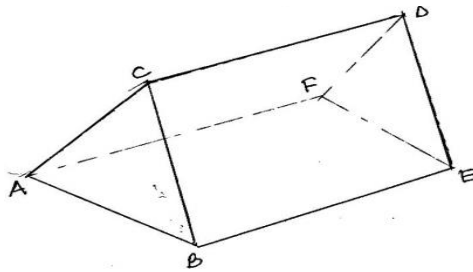
$$\frac{ax + bx + ya + yb}{ma + mb + na + nb}$$

14. Evaluate: $\frac{-12 \div (-3) \times 4 - (-20)}{-6 \times 6 \div 3 + (-6)}$ **(3 marks)**

15. Use the tables of cubes to evaluate: **(3 marks)**

$$(3.461)^3 - \sqrt[3]{2809}$$

16. The figure below is a prism whose cross-section is an equilateral triangle such that $AB=BC=CA=3\text{cm}$, $BE=CD=AF=5\text{cm}$



Draw the net of the prism

(3marks)

SECTION II (50 MARKS)

17. A line L passes through point $(-2,3)$ and $(-1, 6)$ and is perpendicular to a line P at $(-1, 6)$
- Find the equation of L . (3marks)
 - Find the equation of P in the form $ax + by = c$. (3marks)
 - Given that another line Q is parallel L and passes through point $(1, 2)$, find the x and the y intercepts of line Q . (2marks)
 - Find the point of intersection of lines P and Q . (2marks)
18. Triangle PQR has vertices at $P(2,3)$, $Q(1,2)$ and $R(4,1)$, while triangle $P^1Q^1R^1$ has vertices at $P^1(-2,3)$, $Q^1(-1,2)$, $R^1(-4,1)$.
- Draw triangle PQR and $P^1Q^1R^1$ on the grid provided below (2marks)
 - Describe fully a single transformation which maps triangle PQR onto triangle $P^1Q^1R^1$. (1mark)
 - On the same plane, draw triangle $P^{11}Q^{11}R^{11}$ the image of PQR , under reflection on line $y + x = 0$ (2marks)
 - Describe fully a single transformation which maps triangle $P^{11}Q^{11}R^{11}$ onto triangle $P^1Q^1R^1$. (1mark)
 - Draw triangle $P^{111}Q^{111}R^{111}$ such that it can be mapped onto triangle PQR by a positive quarter turn about the origin (2marks)
 - State all pairs of triangles that are oppositely congruent (2marks)
19. A businessman sold a car at sh.900 000 after allowing his customer a 10% discount on the marked price of the car. In so doing he made a profit of 20%.

- a) Calculate
- (i) The marked price of the car. (3 marks)
- (ii) The price at which the businessman had bought the car (2marks)
- b) If the businessman had sold the same car without giving a discount. Calculate the percentage profit he would have made. (3 marks)
- c) In the month of December the businessman sold 20 vehicles without giving a discount. Determine the total profit he received from the sale. (2 marks)
20. Four towns A, B, C and D are such that town B is 180 km East of A. Town C is at a distance of 120km on a bearing of 300° from B. Town D is due West of C and North Of A.
- (a) Using a scale of 1cm to represent 20km, make an accurate scale drawing to show the relative positions of the towns. (4 marks)
- (b) Find:
- (i) Determine the bearing of C from A (1mark)
- (ii) Determine the distance of C from D (2 marks)
- (iii) Determine the bearing of B from D (1 mark)
- (iv) Determine the distance of A from D (2 marks)
21. The measurements (in metres) of a field were given in a field note book as follows:
Base line XY = 240m
- | | | |
|---------|----------------------------|--------------------|
| To Q 60 | Y
150
120
50
X | 50 to P
20 to M |
|---------|----------------------------|--------------------|
- (a) Using a scale of 1 cm to represent 20 m, draw an accurate map of the farm. (4 marks)
- (b) Find the area of the field in hectares. (4marks)
- (c) If the farm is on sale at sh. 900 000 per hectare, find how much the farm costs. (2 marks)
22. Triangle ABC is such that AB = 7cm, angle ABC = 120° and angle BAC = 30° .

- (a) Using a ruler and a pair of compass only, construct triangle ABC. (3 marks)
- (b) Measure the length of:
 - (i) Line BC (1 mark)
 - (ii) Line BC (1 mark)
- (c) Drop a perpendicular from C to meet line AB extended at M. (2 marks)
- (d) Measure the length of line CM (1 mark)
- (e) Calculate the area of triangle ABC (2 marks)

23. A hollow metal pipe whose internal and external and internal diameters are 6.3cm and 2.8cm respectively is 3.5m long.

- (a) Calculate the volume of the metal used to make the pipe. (4 marks)
- (b) The pipe is melted down and recast into a solid cylinder of height 1.75m. Calculate the radius of the cylinder to two decimal places. (4 marks)
- (c) Given that the density of the metal above is 4.2g/cm^3 , calculate the mass of the solid cylinder in kilograms. (2 marks)

24. Three business people Kamau, Gachui and Maina agreed to contribute Kshs. 1 210 000 to start a business. The ratio of Kamau's contribution to Gachui's contribution is 3 : 2 while that of Gachui to Maina is 1 : 3.

- (a) Determine the ratio of Kamau's contribution to Maina's contribution. (2 marks)
- (b) Determine the amount of money contributed by Kamau (2 marks)
- (c) They agreed to share their profits as follows;

50% to be shared in the ratio of their contributions

40% to be retained for the running of the business

10% to be set aside for emergencies

If their total profit for the year 2014 was sh.704 000, determine the

- (i) Amount of money retained for running the business. (2 marks)
- (ii) The amount of money set aside for emergencies. (2 marks)
- (iii) The amount of received by Gachui (2 marks)

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 03

SECTION 1(50MKS)

1. Evaluate without using a calculator.

$$\frac{4 \text{ of } 20 + 10 \div -5 \times 6}{6 \times 9 - 4 \div 2 + 12} \quad (3\text{mks})$$

2.
$$\frac{0.24 + (-0.3 \times -0.81)}{0.08 \div 0.4} \quad (3\text{mks})$$

3. a) Find the H.C.F of 36 and 54 (1mk)
b) If three numbers 36, 54 and another number have a G.C.D of 6 and L.C.M of 216, find the other number (2mks)

4. a) Simplify the expression (3mks)

$$\frac{3x + 4}{4} + \frac{x + 1}{2} - \frac{2x + 8}{3}$$

- b) Solve for x in the equation below.

$$2(x+4) = 14 \quad (2\text{mks})$$

5. Use a number line to work out the following:

i) $3 + -4$ (1mk)

ii) $5 - -2$ (1mk)

6. The length of an arc of a circle is 88cm. Find the radius of the circle if the arc subtends an angle 144° at the centre (Take $\pi = 22/7$) (3mks)

7. Four men can build a stone wall 32m long in 12 days. What length of wall can eight men, working at the same rate, build in eight days. Give your answer to 4 significant figures (3mks)

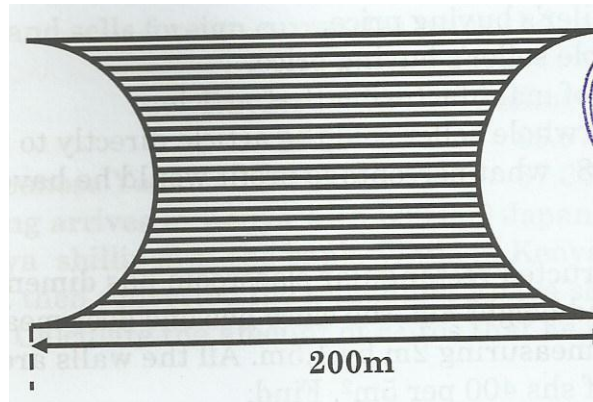
8. A shopkeeper made a loss of 20% by selling a trouser at Sh. 960 . What profit would he have made if he had sold it at sh.1500 **(3mks)**
9. A girl spent $\frac{2}{5}$ of her pocket money on bread and $\frac{1}{6}$ of the remainder on stationery. If she had Ksh. 200 left at the end of the term, how much pocket money did she have at the beginning of the term. **(3mks)**
10. Small cubes of edge 2cm are to be packed into a rectangular container measuring 6 cm by 5 m and 4 m. How many cubes are required ? **(3 mks)**
11. If $a:b = 2:3$ and $b:c = 5:9$, find the ratio $a:c$ **(2mks)**
12. Express $0.\dot{4}0\dot{7}$ as a fraction. **(3mks)**
13. Three bells ring at intervals of 40 minutes, 45 minutes and 60 minutes. If they ring simultaneously at 6.30 am, at what time will they ring next together? **(3mks)**
14. The area of 10 square plots is 160 ares . Find the length in metres of the side of each plot **(3mks)**
15. Find the perimeter of a circular protractor whose radius is 14 cm **(3mks)**
16. Convert the following decimals into percentage **(3 mks)**
- (i) 0.67
- (ii) 1.25
- (iii) 0.167

ANSWER ALL THE QUESTIONS IN THIS SECTION

SECTION II (50MKS)

- 17.(a) A cylindrical can of diameter 20 cm and height 60cm is filled with water using a cylindrical jar of diameter 10 cm and height 8 cm. How many jarfuls will fill the can? **(5 mks)**
- (b) Find the surface area of an isosceles triangular prism of length 25 cm, height 4.5 cm and base 6 cm **(5 mks)**
18. (a) Find the area of the sector of a circle of radius 3 cm if the angle subtended at the centre at the centre is 140° . (Take $\pi = \frac{22}{7}$) **(4mks)**
- (b) A minor arc of a circle subtends an angle of 105° at the centre of the circle. If the radius of the circle is 8.4 cm, find the length of the major arc **(3 mks)**
- (c) Calculate the surface area of a rectangular tank measuring 5.4 cm long, 3.6 cm width and 1.8 cm high. **(3 mks)**
- 19.(a) All prime numbers less than ten are arranged in descending order to form a number
- (i) Write down the number formed **(2 mks)**
- (ii) State the total value of the second digit in the number formed in a(i) above **(2 mks)**
- (b) The lengths of wires were 30 m, 36 m and 84 m. Pieces of wire of equal length were cut from the three wires. Calculate the least number of pieces obtained. **(6 mks)**
20. (a) When a certain number is divided by 30, 45 or 54 there is always a remainder of 21. Find the number **(4 mks)**
- (b) A square toilet is covered by a number of whole rectangular tiles of sides 60 cm by 48 cm. Calculate the least possible area of the room in square metres **(3 mks)**
- (c)(i) Express 1050 in terms of its prime factors **(1 mk)**
- (ii) Determine the smallest positive number such that $1050P$ is a perfect square **(2 mks)**

21. The following figure represents a piece of land . The two ends are semicircles of radius 70m each.



- a) Calculate
- (i) The perimeter of the land (2mks)
- (ii) The area of the land in hectares (3mks)
- b) A private developer bought this piece of land at a price of Ksh 5,000,000 per hectare and later sold the all land at Kshs. 14,760,000. Determine
- (i) The price at which he bought the whole piece of land (2mks)
- (ii) His percentage profit (3mks)

FORM TWO HOLIDAYS KEYNOTE
MATHEMATICS QUESTION PAPER NO: 04

SECTION I(50 MARKS)

1. Without using logarithm tables or a calculator evaluate.

$$\frac{0.015 + 0.45}{4.9 \times 0.2 + 0.07} \div 1.5$$

giving the answer in decimal form.

(3mks)

2. The size of an interior angle of a regular polygon is 156° . Find the number of sides of the polygon. (2mks)

3. Factors the expression $a^2 - b^2$ (1mk)

Hence find the exact value of $63.7^2 - 36.3^2$

(2mks)

4. Arrange the following fractions in ascending order $\frac{7}{24}, \frac{5}{16}, \frac{3}{8}, \frac{9}{32}, \frac{1}{4}$ (2mks)

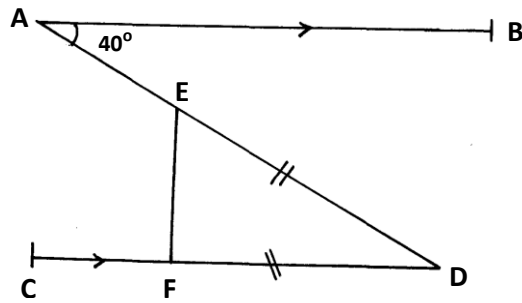
5. A clock loses 6 minutes in every 24 hours. If it is showing the correct time at mid-day on Monday. What is the correct time on Thursday when the clock shows 6.00p.m (3mks)

6. Without using a calculator evaluate $2\frac{1}{4} + \frac{3}{4} \div \frac{5}{6}$ of $2\frac{2}{5}$ leaving the answer as a $\frac{17}{10}$ fraction in its simplest form (4mks)

7. Use logarithms to evaluate $\frac{8.072 \times (0.7432)^{\frac{1}{2}}}{(0.824)^2}$ (3mks)

8. Evaluate $\frac{64^{-\frac{1}{2}} \times 27000^{\frac{2}{3}}}{2^{-4} \times 3^0 \times 5^2}$ (4mks)

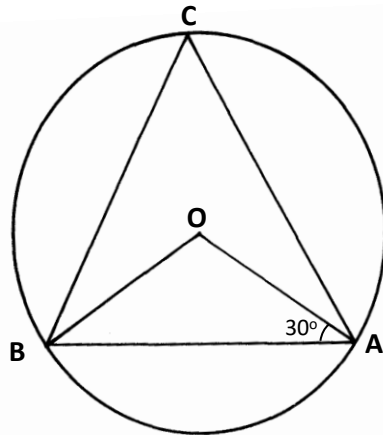
- 9 In the figure below line AB is parallel to line CD; angle BAD = 40° and Line DE = DF



Calculate the size of angle CFE

(3mks)

10. In the figure below O, is the centre of the circle and angle OAB = 30°



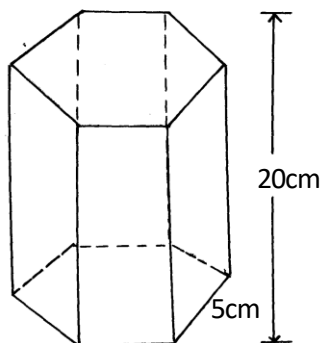
Calculate the size of angle ACB.

(3mks)

11. Calculate the perimeter of a rhombus whose diagonals are 12cm and 5 cm (4mks)

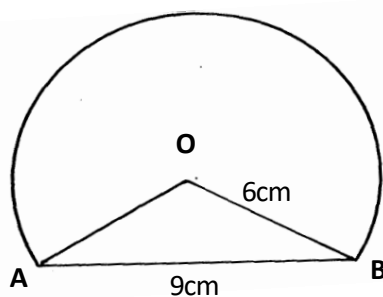
12. A metal hemisphere of radius 12cm is melted down and recast into the shape of a cone of base radius 6cm. find the perpendicular height of the cone. (4mks)

13. The coordinates of the line AB are A (4,6) and B (12,10) . Find the equation of a perpendicular line to line AB, passing through the mid-point of the line AB (3mks)
14. Two similar jugs have capacities 0.25 litres and 2 litres respectively. If the circumference of the smaller jug is 5.8cm calculate the circumference of the larger jug. (3mks)
15. Find the range of values of x which satisfy the inequality. $2x + 1 < 11 < 6x - 1$.
Illustrate your answer on the number line (4mks)
16. The figure below represents a hexagonal prism, whose height is 20cm. the cross – section of the prism is a regular hexagon of side 5 cm. Calculate the volume of the prism; give your answer to 2dp (4mks)



SECTION II (50 MARKS)

17. The figure below shows part of a circle centre O, radius 6cm; the Length of the chord AB is 9 cm



- a) Calculate the area of the major segment (7mks)
- b) Given that the sides of triangle are 7cm, 9cm and 11cm. Calculate the area of the triangle. (3mks)

18a) By choosing any three suitable pairs of values of x and y complete the table of values for each function.

(i) $\frac{x}{2} + 3y = 15$

x			
y			

(2mks)

(ii) $\frac{x}{3} - y = 4$

x			
y			

(2mks)

b) Using the grid provided, and on the same axes, draw the lines $\frac{x}{2} + 3y = 15$ and $\frac{x}{3} - y = 4$ **(4mks)**

c) Use your graph to solve the equations $\frac{x}{2} + 3y = 15$
 $\frac{x}{3} - y = 4$

(2mks)

19. The ratio of Kipto's Salary to Mary's is 5:3. Kipto's salary rose by 12% to Kshs. 22400. Mary's salary was also raised by $x\%$. The total of their new salaries was Kshs. 36 200.

a) Calculate

(i) Kipto's Salary before the increase

(2mks)

(ii) Mary's Salary before the increase.

(2mks)

(b) Determine Mary's salary after the increase.

(1mk)

(c) What was the percentage increase in Mary's Salary.

(2mks)

(d) Determine the new ratio of their salaries.

(2mks)

(e) Calculate the combined percentage increases for both of them.

(1mk)

20. The mean mass of 5 boys is 54.4 kg. Three boys of masses 52kg, 55.1 kg and 57.5 kg join the five. Calculate the mean mass of the 8 boys (3mks)

b) The table below shows the distribution of ages of workers in certain organization.

Age (Years)	Number of Workers
20 – 24	5
25 – 29	10
30 – 34	18
35 -39	15
40 - 44	12

- i) State the modal class (1mk)
- ii) Calculate the mean age (3mks)
- iii) Calculate the median age (3mks)

21. a) A solid sphere of radius 8.4cm is dropped into a cylinder of radius 12cm and containing water upto a height of 10cm.
Determine the new height of water in the cylinder (6mks)

- b) If the mass of the sphere is 100g; determine
- (i) Density of the solid. (2mks)
 - (ii) Volume of similar solid which is irregular given that its mass is 800g; correct to the nearest cm^3 . (2mks)

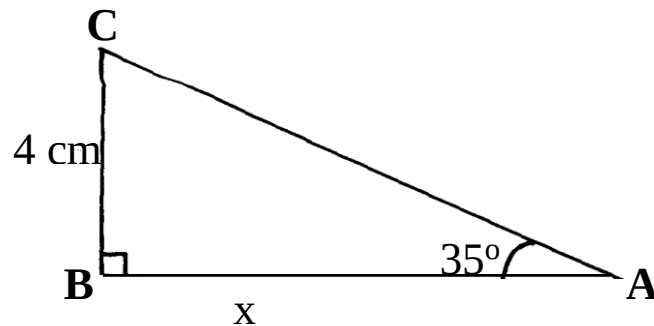
22. If $x + y = 3$ and $x^2 + y^2 = 29$. Determine the values of
- (i) $x^2 + 2xy + y^2$ (1mk)
 - (ii) $2xy$ (1mk)
 - (iii) $x^2 - 2xy + y^2$ (1mk)
 - (iv) $x - y$ (2mks)

- (b) Find the values of x and y (3mks)
- (c) If $x = -2$ is a root of $x^2 + kx + 8 = 0$, find the other root. (2mks)

23. a) Two observers, A and B 500m apart observe a kite in the same vertical plane and from the same side of it. The angles of elevation of the Kite are 30° and 20° respectively. Find how high, the Kite was from the observers. (6mks)

Solve the equation $\cos x = \sin 5x$ (2mks)

- c) In the right angle triangle below. Find the length of AB in 2d.p (2mks)



24. A rectangle has a diagonal of 15.2cm. The diagonal makes an angle of 28° with the shorter side of the rectangle

a) Calculate

- (i) The Length and width of the rectangle. (4mks)

- (ii) The area of the rectangle. (2mks)

- (b) A triangular plot has two equal sides. The two equal sides meet at an angle of 40° .

The area of the plot is 128.56m^2 . Calculate the lengths of the sides of the plot. (4mks)

FORM TWO HOLIDAYS KEYNOTE
MATHEMATICS QUESTION PAPER NO: 05

1. Evaluate

$$\frac{-3(4+2)-8 \div 4 + 3}{-2 \times -4 + -6 \times 5}$$

(3 marks)

2. Find the value of x, which satisfies the equation.

$$16^{x^2} = 8^{4x-3}$$

(3 marks)

3. Evaluate;

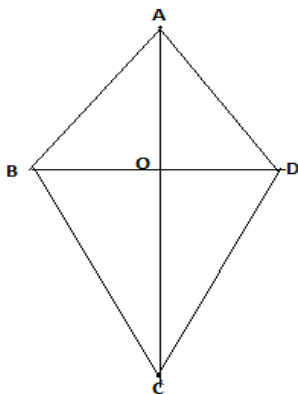
(3 marks)

$$14 \div \frac{1}{3} \text{ of } 5\frac{1}{4} - 3\frac{3}{4} \times 1\frac{1}{3}$$

4. Find the length of a square whose diagonal is 8cm to one decimal place

(3 marks)

5. The figure below represents a kite ABCD, AB = AD = 15cm. The diagonals BD and AC intersect at O, AC = 30cm and AO = 12cm.



Find the area of the kite.

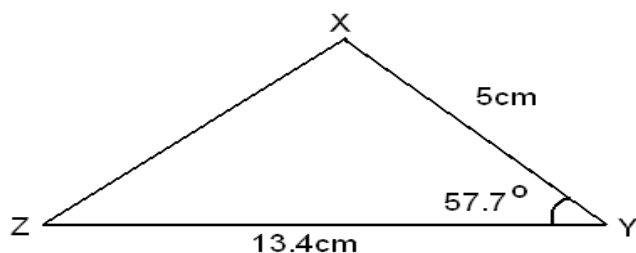
(3 marks)

6. Using logarithm tables evaluate; (4 marks)

$$\sqrt[3]{\frac{4.684 \times 2.497}{\tan 87^\circ}}$$

7. A straight line L passes through the point (3, -2) and is parallel to a line whose equation is $2y - 4x = 1$. Find the equation of line L in the form $y = mx + c$. (3 marks)

8. The figure below is a triangle XYZ. $ZY = 13.4\text{cm}$, $XY = 5\text{cm}$ and $\angle XYZ = 57.7^\circ$



- Find the area of triangle XYZ. (3 marks)

9. Using a ruler and a pair of compass only, construct a parallelogram ABCD such that $AB = 8\text{ cm}$, $BC = 6\text{ cm}$ and angle $ABC = 135^\circ$. (3 marks)

10. Write the following as a single fraction (3 marks)

$$\frac{(2x+1)}{4} - \frac{2x-1}{3}$$

11. Calculate the length of an arc of a circle radius 14cm that is subtended by an angle 22.5° at the centre (3 marks)

12. Given that $\cos A = \frac{5}{13}$ and angle A is acute, find the value of $2 \tan A + 3 \sin A$. (3 marks)

13. Two similar containers have base areas of 750 cm^2 and 120 cm^2 respectively.

a) Find the ratio of their radii (1 mark)

b) Find the ratio of their volume. (1 mark)

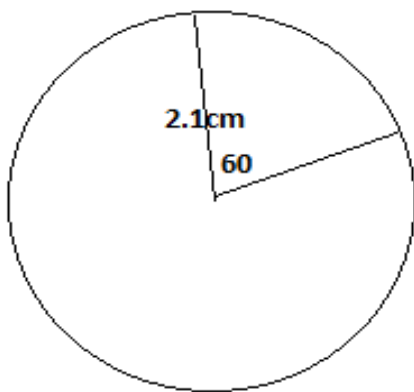
c) Calculate the volume of the larger container if the volume of the smaller container is 400 cm^3 (2 marks)

14. A plane leaves town P to town Q on a bearing of 130° and a distance of 350 km. it then flies to town R 500 km away and on a bearing 060° . Find by scale drawing the distance of R from P (3 marks)

15. Simplify the expression; (3 marks)

$$\frac{2t^2 - 3pt - 2p^2}{4t^2 - p^2}$$

16. If O is the center of part of the circle shown below, find the area of the figure (3 marks)



SECTION II (50 Marks)

Answer ALL questions in this section in the spaces provided.

17. Saleswoman is paid a commission of 2% on goods sold worth over Ksh 100 000. She is also paid a monthly salary of Ksh 12 000. In a certain month, she sold 360 handbags at Ksh 500 each.

- a.** Calculate the saleswoman's earnings that month. **(3 marks)**
- b.** The following month, the saleswoman's monthly salary was increased by 10%. Her total earnings that month were Ksh 17 600.

Calculate

- i)** the total amount of money received from the sales of handbags that month; **(5 marks)**
- ii)** The number of handbags sold that month. **(2 marks)**

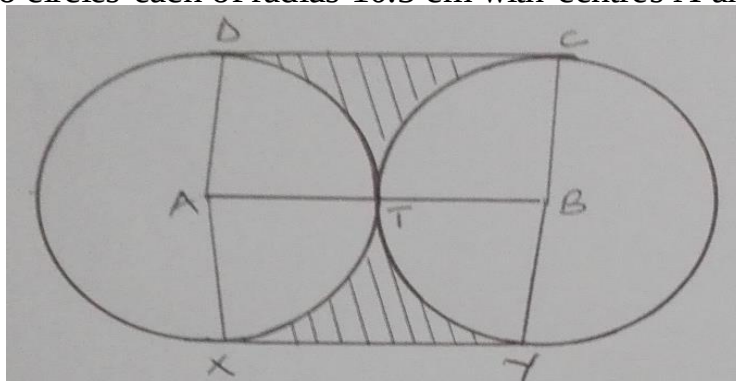
18. A triangle whose vertices are $A'(-2, -2)$, $B'(-4, -1)$ and $C'(-3, 1)$ is an image of a triangle whose vertices are $A(1, 1)$, $B(2, 3)$ and $C(4, 2)$ under a rotation.

- a)** On the grid below, draw the x and y axes such that values of x range between -6 and 6 and values of y range between -7 and 3 . **(1 mark)**

Provide a graph paper

- b)** Draw the triangles ABC and $A'B'C'$ on the same axes. **(2 marks)**
- c)** Hence determine the centre and angle of rotation. **(4 marks)**
- d)** $A''B''C''$ is the image of $A'B'C'$ under enlargement centre $(-2, 3)$ and scale factor 2. Draw $A''B''C''$ and state its coordinates. **(3 marks)**

19. A small cylinder of radius 3.5cm and height 10 cm has a mass of 385 kg , Calculate
- a) The volume of the cylinder in m^3 (Take $\pi = \frac{22}{7}$) (3 marks)
- b) The density of the materials making the cylinder in kg/m^3 (2 marks)
- c) The cylinder was melted and the molten materials recasted into four identical cuboids each of a square base of side x cm and height 10cm. Determine the value of x to 4 significant figures. (5 marks)
20. The figure below shows two circles each of radius 10.5 cm with centres A and B. the circles touch each other at T.



Given that $\angle XAD = \angle YBC = 160^\circ$ and lines XY, ATB and DC are parallel. Calculate the area of:

- a) The minor sector AXTD (2 marks)
- b) Figure AXYBCD (6 marks)
- c) The shaded region (2 marks)
21. A glass of radius 3 cm in the form of a cylinder contains water to a height of 9 cm.
- a. Find the volume of the water in the glass correct to 2 decimal places in cubic centimetres. (2 marks)
- b. When a spherical marble is submerged into the water in the glass, the water level rises by 1 cm.
- Calculate;
- i. The volume of the marble correct to 2 decimal places. (2 marks)
- ii. Radius of the marble correct to 2 decimal places. (3 marks)
- iii. If the height of the glass is 13 cm, calculate the surface area of glass not in contact with water after the above process. (3 marks)

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 06

SECTION I (50 MARKS)

Answer ALL the questions in this section in the spaces provided.

1. Evaluate

(3 Marks)

$$\frac{-12 \ 3 \times 4 - (-15)}{-5 \times 6 \ 2 + (-5)}$$

2. Evaluate without using a calculator.

(3 Marks)

$$\frac{(2\frac{3}{7} - 1\frac{5}{6}) \div \frac{5}{6}}{\frac{2}{3} \text{ of } 2\frac{1}{4} - 1\frac{1}{7}}$$

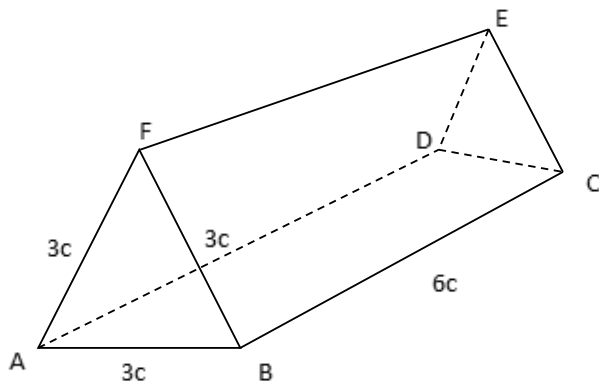
3. Use logarithms to evaluate.

(4 Marks)

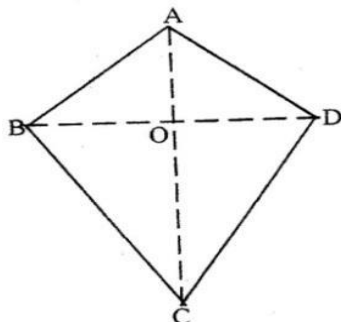
$$\sqrt[4]{\frac{43.52 \times 0.08792}{785.3}}$$

4. Find the equation of the L_1 in the form $y = mx + c$ which is perpendicular to the line $3y + 2x = 6$ and passes through the point $(-3, 4)$. (3mks)

5. The diagram below represents a prism of length 6cm whose cross-section is an equilateral triangle of sides 3cm. Draw a well labeled sketch of the net of the prism. (3 Marks)

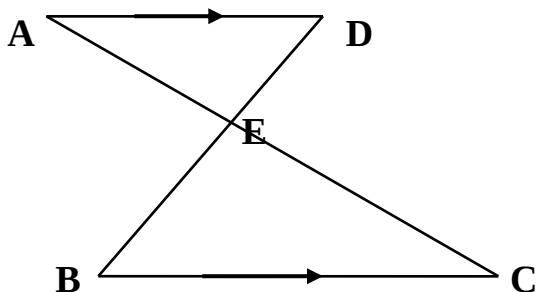


6. The figure below represents a kite ABCD, $AB = AD = 15$ cm. The diagonals BD and AC intersect at O. $AC = 30$ cm and $AO = 12$ cm. Find the area of the kite **(3mks)**



7. Mrs. Musyoka has Sh. 700 in Sh. 50 notes and Sh. 100 notes only. If she has a total of 11 notes find how many notes she has of each denomination. **(3mks)**

8. In the figure below $AD \parallel BC$. AC and BD intersect at E. Given that $AE: EC = 1:5$ and $BD = 12$ cm, calculate the length of DE.



(3 marks)

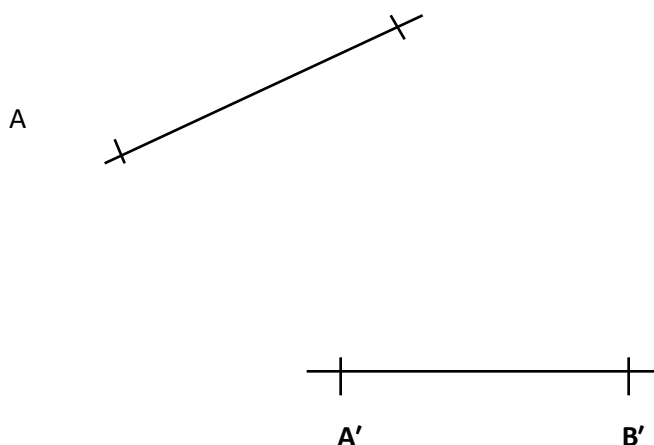
9. Given that $(3x - 35) = \cos \cos (x + 20)$. Find $x + 10$ **(3mks)**

10. Without using a mathematical tables or a calculator evaluate $\sqrt{\frac{153 \times 0.18}{0.68 \times 0.32}}$. **(3mks)**

11. Three bells ring at intervals of 9 minutes, 15 minutes and 21 minutes. The bells will next ring together at 11.00pm. Find the time the bells had last rung together. **(3 Marks)**

12. The surface areas of two similar bottles are 12cm^2 and 108cm^2 respectively. If the bigger one has a volume of 810cm^3 . Find the volume of the smaller one. **(3 Marks)**

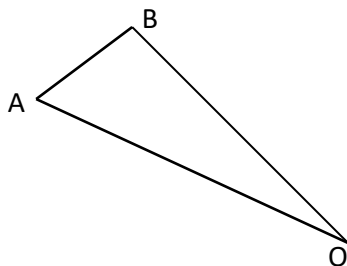
13. In the figure below $A'B'$ is the image of AB under rotation. By construction, find and label the centre O of the rotation. Hence, determine the angle of the rotation. **(4mks)**



14. Mr. Ombogo the principal of Chiga secondary would wish to cover the floor of the new administration block using the square tiles. The floor is a rectangle of sides 12.8m by 8.4m . Find the area of each of the largest tiles which can be used to fit exactly without breaking **(3mks)**

15. The size of an interior angle of a regular polygon is $(3x)^\circ$ while the exterior angle is $(x + 20)^\circ$. Find the number sides of the polygon **(3 Marks)**

16. In the figure below triangle ABO represents a part of a school badge. The badge has as symmetry of order 4 about O . Complete the figure to show the badge. **(3mks)**



SECTION II (50MKS)

Answer 5 questions only in this section

17. The vertices of quadrilateral OPQR are O (0, 0), P (2, 0), Q (4, 2) and R (0, 3). The vertices of its image under a rotation are O' (1, -1), P'(1, -3) Q'(3, -5) and R'(4, -1).

(a) (i) On the grid provided, draw OPQR and its image O'P'Q'R' (2marks)

(b) (ii) By construction, determine the centre and angle of rotation. (3marks)

(c) On the same grid as (a) (i) above, draw O''P''Q''R'', the image of O'P'Q'R' under a reflection in the line $y = x$ (3marks)

(d) From the quadrilaterals drawn, state the pairs that are:

(i) Directly congruent; (2marks)

(ii) Oppositely congruent (2marks)

18. A slaughter house bought a number of goats at Sh. 2000 each and a number of bulls at Sh. 15000 each. They paid a total of Sh. 190,000. If they bought twice as many goats and three bulls less, they would have saved Sh. 5000.

(a) If the number of goats and bulls bought were x and y respectively, write down two simplified equations involving the above information. (2mks)

(b) Solve the two equations above and hence find the number of each type of animals bought. (4mks)

(c) The slaughter house sold all the animals at a profit of 25% per goat and 30% per bull. Determine the total profit they made. (4 Marks)

19.a) In a safari rally drivers are to follow route ABCDA. B is 250km from A on a bearing of 075° from A. C is on a bearing of 110° from A and 280km from B. The bearing of C from D is 040° and a distance of 300km. By scale drawing show the position of the point A, B, C and D. (4mks)

b) Determine

(i) The distance of A from C. (2mks)

- (ii) The bearing of B from C. (1mk)
- (iii) The bearing of A from D. (1mks)
- (iii) The distance A from D (2mks)

20. A saleswoman is paid a commission of 20% on goods sold worth over Ksh 100,000. She is also paid a monthly salary of Ksh 12,000. In a certain month, she sold 360 handbags at Ksh 500 each.

(i) Calculate the saleswoman's earnings that month. (3 mks)

(ii) The following month, the saleswoman's monthly salary was increased by 10%. Her total earnings that month were Ksh 17,600.
Calculate the total amount of money received from the sales of handbags that month. (5mks)

(ii) The number of handbags sold that month. (2 mks)

21. Using a ruler and a pair of compasses only, draw a parallelogram ABCD, such that angle DAB = 75° . Length AB = 6.0cm and BC = 4.0cm.

From point D, drop a perpendicular to meet line AB at N. (7 Marks)

(i) Measure length DN. (1 Mark)

(ii) Find the area of the parallelogram. (2 Marks)

22. Two cubes of length 5cm and 7cm are melted and cast into a single cube.

Determine the:

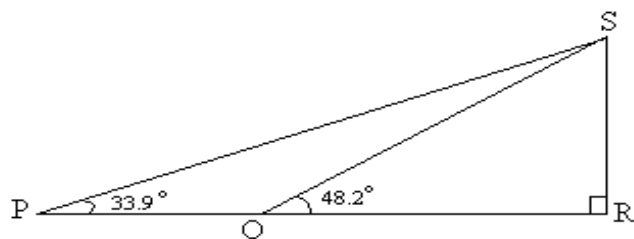
i. Volume of the new cube (3mks)

ii. Length of the new cube correct to 1 decimal place (2mks)

iii. Surface area of the new cube (2mks)

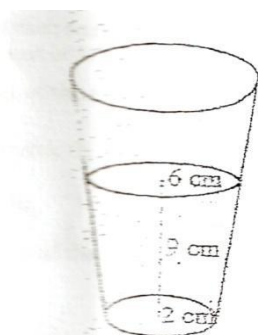
b. Suppose that it was instead cast into a cylinder of radius 3.5 cm. what would the height be to the nearest cm? Take $\pi = \frac{22}{7}$, (3 mks)

23. The diagram below shows vertical telephone pole RS supported by wires SP and SQ pegged at points P and Q respectively on a level ground. Points P and Q are on the same straight line from the base R of the pole. The angles of elevation of S from P and Q are 33.9° and 48.2° respectively. Given that $PR = 5$ m, calculate:



- The distance QR (4 marks)
- The length of the wires SP and SQ (4 marks)
- If the cost of the pole and labour is sh. 1600 and the cost of 1 meter of the wire is sh. 233. Find the total cost of the installation. (2 marks)

24. A glass in the form of a frustum of a cone, is represented by the diagram below. The glass contains water to a height of 9 cm. The bottom of the glass is a circle of radius 2 cm while the surface of the water is a circle of radius 6 cm.



- Calculate the volume of the water in the glass. (3Mks)
- When a special marble is submerged into the water in the glass, the water level rises by 1 cm.
Calculate :
 - the volume of the marble (4 marks)
 - the radius of the marble (3 marks)

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 07

SECTION I (50 Marks)

Answer **all** the questions in this section

1. Evaluate

(3 marks)

$$\frac{2\frac{1}{5} + \frac{2}{3} \text{ of } 3\frac{3}{4} - 4\frac{1}{6}}{1\frac{1}{4} - 2\frac{2}{5} \div 1\frac{1}{3} + 3\frac{3}{4}}$$

2. Three metallic tanks have the capacities of 447 litres, 577 litres and 669 litres. Find the capacity of the largest container that can fill the tanks an exact number of times, leaving a remainder of 7 litres, 5 litres and 9 litres respectively. (3 marks)

3. The marked price of a computer is Kshs. 72,000. Rhenice bought the computer at a discount of 8%. The dealer still made an 20% profit. Calculate the amount of money the dealer paid for the computer. (3 marks)

4. Use tables of squares, square roots and reciprocals only to evaluate (4 marks)

$$\frac{1}{\sqrt{446.9}} - 0.1273^2$$

5. The length of a grass lawn is 2 metres less than twice its width. The area of the lawn is 60 m², calculate its length (3 marks)

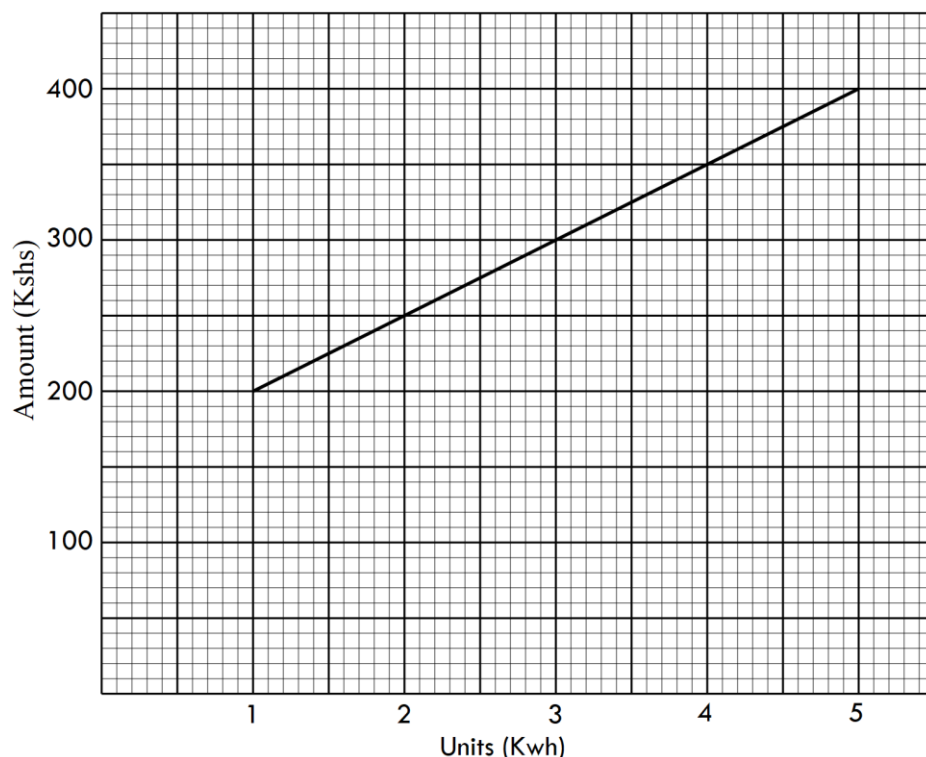
6. The figure below shows part of a solid cuboid ABCDEFGH



Complete the solid

(3 marks)

7. The graph below shows the relationship between the electricity bill (in Kshs.) and the number of units consumed (in kilowatt hours)



Use a graph to determine the

(a) fixed charge of the bill. (1 mark)

(b) cost per unit of the consumption (2 marks)

8. Solve for x in the equation (3 marks)

$$(3^{2x})^3 = 81 \times 9^4$$

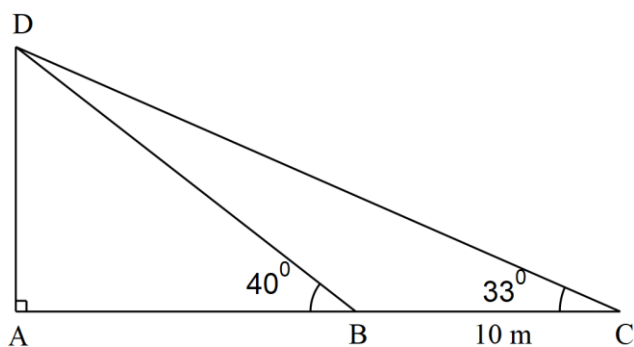
9. Given that $\mathbf{p} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ and $\mathbf{r} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ and find $|\mathbf{q}|$ given that $\mathbf{q} = 3\mathbf{p} - 2\mathbf{r}$. (3 marks)

10. The cost of four exercise books and three pens is Kshs. 630. Five similar exercise books and two similar pens cost Kshs. 70 more. Calculate the cost of each item. (3 marks)

11. Two similar containers have surface areas of 700 cm^2 and 1008 cm^2 respectively. If the height of the larger container is 29.4 cm, calculate the height of the smaller container. **(3 marks)**

12. The cross-section of a swimming pool is such that the shallow end is 1 metre deep and the deepest end 1.5 metres deep. The width of the pool is 6 metres. Given that the pool is 15 metres long, calculate the capacity of water if the swimming pool is full. **(3 marks)**

13. Calculate the distance AB in the figure below. Give your answer correct to 4 significant figures. **(4 marks)**



14. A number P is formed by writing all the prime numbers between 0 and 10 in ascending order while another number Q is formed by writing all the square numbers between 0 and 10 in descending order.

(a) Find $P - Q$ **(2 marks)**

(b) Hence find the total value of the third digit in the answer of $P - Q$ **(1 mark)**

15. Using a ruler and a pair of compasses only, construct a triangle PQR in which $PQ = 8.7 \text{ cm}$, $\angle PQR = 52\frac{1}{2}^\circ$ and $QR = 4 \text{ cm}$. Measure PR **(3 marks)**

16. Oscar started a road trip that took him a total of 9 hours 28 minutes and completed the trip on a Tuesday at 6.03 a.m. At what time did he start the trip? Give your answer in 12 hour clock system **(3 marks)**

SECTION II (50 Marks)

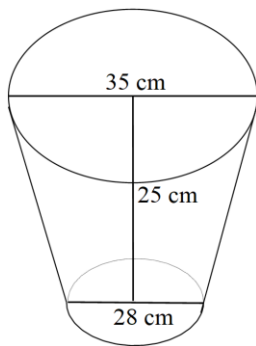
Answer any **five** questions in this section

17. The table below shows the marks scored by 50 students in a Zeraki Achievers' Examination.

Marks (%)	20 – 24	25 – 34	35 – 39	40 – 54	55 – 59	60 – 74
Number of Students	7	8	10	13	9	3

- (a) Calculate
- (i) The mean mark (4 marks)
- (ii) The median mark (3 marks)
- (b) The mean age of 14 students is 16 years. If two more students join them, the new mean becomes 16.5 years. If one of the added student is 22 years old, find the age of the other student. (3 marks)
18. (a) On the grid provided, draw the square whose vertices are $P(6, -2)$, $Q(7, -2)$, $R(7, -1)$ and $S(6, -1)$ (1 mark)
- (b) On the same grid, draw:
- (i) $P'Q'R'S'$ the image of PQRS, under an enlargement scale factor 3, centre $(9, -4)$. State the coordinates of $P'Q'R'S'$ (3 marks)
- (ii) $P''Q''R''S''$ the image of $P'Q'R'S'$ under a reflection in the line $y = 0$. (2 marks)
- (iii) $P'''Q'''R'''S'''$ the image of $P''Q''R''S''$ under a rotation of -90° about $(0, 0)$ (2 marks)
- (c) Describe a single transformation that maps $P'Q'R'S'$ on to $P'''Q'''R'''S'''$. (2 marks)

19. The diagram below shows a solid frustum whose top and bottom diameters are 35 cm and 28 cm respectively. The height of the frustum is 25 cm. Using $\pi = \frac{22}{7}$



- (a) Calculate the volume of the solid (6 marks)
- (b) The frustum is melted and recast into a solid sphere. Calculate the radius of the sphere correct to 2 decimal places . (4 marks)

20. A matatu left a town P at 9.00 a.m. for town Q, 51 km away at an average speed of 48 km/h. Half an hour later, a car left town Q for town P travelling along the same route at an average speed of 60 km/h.

Find;

- (a) (i) the time they met (3 marks)
- (ii) how far they met from town P (2 marks)
- (b) A body starts from rest and accelerates uniformly attaining a velocity of 40 m/s in three seconds. It maintains this velocity for five seconds, and then decelerates at 8 m/s^2 for two seconds. It further decelerates uniformly and comes to rest in four seconds.

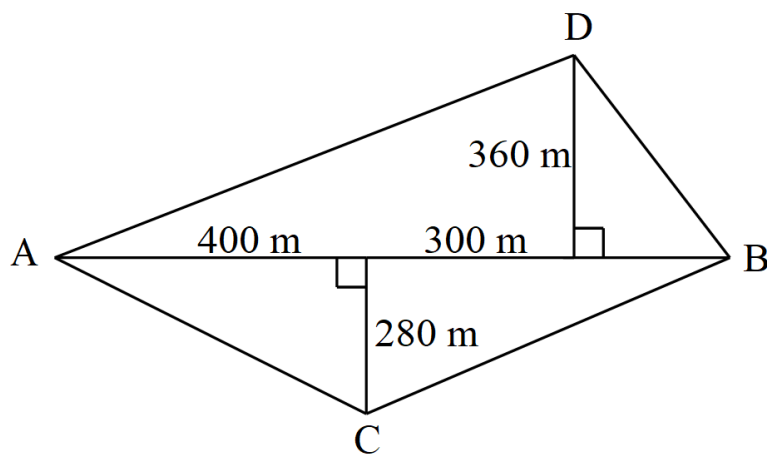
- (i) Using the information above, calculate the value of a and b in the table below. (2 marks)

Time (seconds)	0	3		10	14
Velocity (m/s)	0	40	40		0

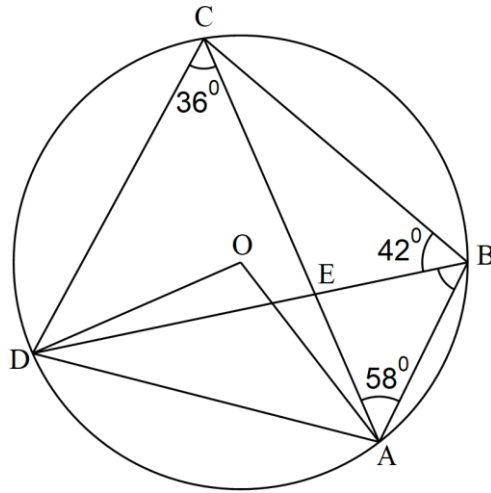
- (ii) Hence, calculate the total distance covered by the body. (3 marks)

21. Samantha and Kerina entered into a joint business venture in which they contributed Kshs. 150,000 and Kshs. 120,000 respectively every year. After one year, Joyce joined the venture too and contributed Kshs. 90,000.
- (a) Calculate the ratio of their investment after 3 years of business **(3 marks)**
- (b) The agreed as follows; that 30% of the profits after 3 years be used to cater for the operational costs of the business while the rest would be shared proportionately. At the end of the third year, the profit was Kshs. 1,870,000. Calculate each person's share. **(4 marks)**
- (c) Samantha and Kerina put their shares together and bought fish cages at Kshs 25, 500 per cage. Calculate the number of fish cages they bought. **(3 marks)**
22. A straight line L_1 whose equation is $3y - 2x = -2$ meets the x- axis at R
- (a) Determine the coordinates of R. **(2 marks)**
- (b) A second line L_2 meets L_1 at a right angle at R. Find the equation of L_2 in the form $y = mx + c$, where m and c are constants. **(4 marks)**
- (c) A third line L_3 passing through $(-4, 1)$ is parallel to L_1 . Find the equation of L_3 in the form $ax + by + c = 0$, where a , b and c are integers. **(2 marks)**
- (d) Calculate the acute angle L_2 makes with the line $y = 0$ **(2 marks)**
23. (a) Three schools, Kisumu School, Sinyolo Girls and Thurdibuoro are such that Sinyolo girls is on a bearing of 062° from Kisumu School at a distance of 32 km. Thurdibuoro is 50 km from Kisumu School and on a bearing of 167° from Sinyolo girls. Using a scale of 1: 500,000,
- (i) Show the relative positions of the three schools **(3 marks)**

- (ii) Use the scale drawing to find:
- Bearing of Kisumu School from Thurdibuoro. **(1 mark)**
 - Distance of Thurdibuoro from Sinyolo girls **(1 mark)**
- (iii) A talent centre **M**, is to be located such that it is equidistant from each of the three schools.
- On the diagram in (i) above, show the position of **M** **(2 marks)**
 - Hence find the bearing of **M** from Sinyolo girls **(1 mark)**
- (b) The figure below shows a school farm. Using $AB=750$ metres as the base line, enter the measurements of the farm in a surveyor's field book **(2 marks)**



24. In the figure below, O is the centre of the circle, ABCD is a cyclic quadrilateral and that $\angle CBD = 42^\circ$, $\angle BAC = 58^\circ$ $\angle DCA = 36^\circ$



Giving reasons, find the values of:

- | | | |
|-----|--------------------|-----------|
| (a) | $\angle DAC$ | (2 marks) |
| (b) | $\angle ADB$ | (2 marks) |
| (c) | Acute $\angle DOA$ | (2 marks) |
| (d) | $\angle BDO$ | (2 marks) |
| (e) | $\angle DEC$ | (2 marks) |

FORM TWO HOLIDAYS KEYNOTE

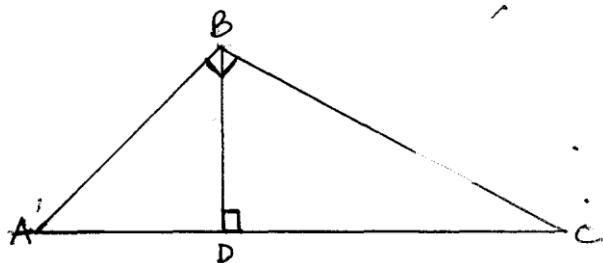
MATHEMATICS QUESTION PAPER NO: 08

SECTION A (Answer all questions in the spaces provided)

1. Arrange the following sets of numbers in descending order. **[2 Marks]**
- 404,044 440,440 440,404 404,444 444,044
2. Prove that 581,526 is divisible by both 9 and 11. **[2 Marks]**
3. When a number u is divided by either 36, 24 or 45, the remainder is always 5. Find the least value of u . **[3 Marks]**
4. Using mathematical tables, find the cubes of each of the following numbers. Leave your answer in standard form.
- a. 2341 **[2 Marks]**
- b. 0.00472 **(2mks)**
5. Use logarithms tables to evaluate; $\frac{743.1 \times 34.8}{15.6 \times 102.7}$ **[4 Marks]**
6. Find the equation of a line that passes through (3, -5) and is perpendicular to a line whose equation is $4x - 5y - 6 = 0$ **[3 Marks]**
7. Two similar vases have their heights in the ratio 3:2. What is the ratio of
- i. Their surface areas **[1 Mark]**
- ii. Their volumes **[1 Mark]**

8. A rectangular container measuring 1.2m long, 70 cm wide and 55 cm high is half full of water. All this water is poured into an empty cylindrical tank of diameter 1.4 metres. Find the height to which the water rises. **(4 mks)**

9. In the triangle below, $AB=12\text{cm}$ $AC=13\text{cm}$ and $\angle ABC=\angle BDC=90^\circ$.



Calculate;

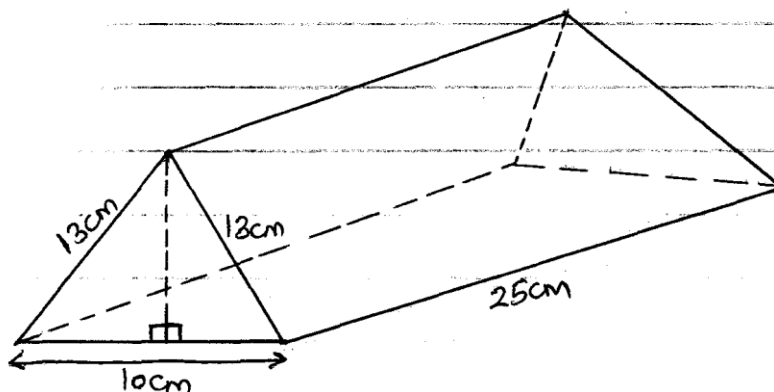
- i. The length of BC **[2 Marks]**

- ii. The length of BD **[2 Marks]**

10. Express as a single fraction in the simplest form; $\frac{x-3}{5} + \frac{2x-5}{4}$ **[3 Marks]**

11. The ratio of boys to girls is 3:2. When $\frac{1}{3}$ of the boys and 6 girls are absent, the ratio remains the same. Find the number of students in the class. **[4 Marks]**

12. The diagram below shows a triangular prism. Determine its total surface area. **[3 Marks]**



13. The size of the interior angle of a regular polygon is x° and the exterior angle is

$$\left(\frac{x-36}{3}\right)^\circ$$

- a. Calculate the value of x [2 Marks]

- b. How many sides does the polygon have? [2 Marks]

14. Solve for the value of θ if [2 Marks]

$$\sin(2\theta + 30) = \cos(2\theta + 20)$$

15. A triangle measures 16cm by 20cm by 24cm. calculate its area using the Hero's formula. [3 Marks]

16. If $a = 8$ and $b = 36$, calculate the value of; [3 Marks]

$$\left(a^{-\frac{2}{3}} + b^{\frac{1}{2}}\right)^{\frac{1}{2}}$$

SECTION B (Answer any 5 questions)

17. The table below is a bus timetable for journeys between towns E and J via towns FGH and I. Use it to answer the questions that follow.

Town	Arrival	Departure
E		0500
F	0630	0645
G	0710	0720
H	0820	0830
I	1145	1230
J	1345	

- a. At what time does the bus leave town G in 12hr system. [1 Mark]
- b. How long does it take between town E and G. [1 Mark]
- c. In which town does the bus stop the longest and for how long? [2 Marks]

d. If the bus does not stop anywhere;
i. How long would it take to travel from town E to town J. [2 Marks]

ii. At what time would it arrive at town J. [1 Mark]

e. If the distance between town G and J is 400km, calculate the average speed between G and J. [3 Marks]

18. In a certain day secondary school in Vihiga County. There were 500 students. The ratio of boys to girls is 3:2.

a. How many more boys than girls are there in the school? [2 Marks]

b. i. One day 10% of the girls and two fifth of the boys went for music and drama festivals. How many students were left in the school? [3 Marks]

ii. During the Festivals each student was given 100/= and the two accompanying teachers were given 1000/= each for lunch. What was the total expenditure? [2 Marks]

c. On a certain morning, $\frac{1}{2}$ of the boys and 0.75 of the girls were sent home for fees. Given that each student brought 2500/= the following day, calculate the total amount of money that was collected. [3 Marks]

19. A line L_1 passes through (3, -2) and (5,4).

a. Determine the gradient of line L_1 [1 Mark]

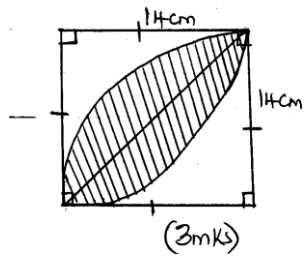
b. The equation of line L_1 [2 Marks]

c. Line L_1 cuts $x - axis$ at point P and the $y - axis$ at point Q. determine the co-ordinates of P and Q. [4 Marks]

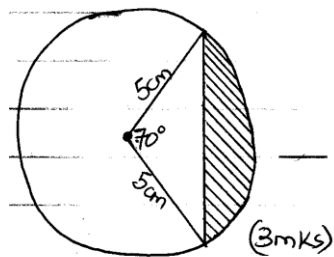
- d. Another line L_2 passes through $(-3,7)$ and is perpendicular to L_1 . Determine its equation. **[3 Marks]**
- 20.** a. Given that the ratio of the areas of two similar solids is 9:25
- i. What is the linear scale factor between the two solids? **[2 Marks]**
- ii. If the length of the smaller solid is 1.2m, what is the length of the bigger solid? **[2 Marks]**
- b. The linear dimensions of a model car are $\frac{1}{16}$ of the dimensions of the actual car.
- i. What is the area of the windscreen of the actual car if the windscreen of the model car is 3cm^2 ? **[2 Marks]**
- ii. If the capacity of the boot of the model car is 15cm^3 , find the capacity of the boot of the model car. **[2 Marks]**
- c. The volume of two similar jugs are in the ratio 8:125. What is the ratio of their surface areas? **[2 Marks]**
- 21.** A triangle PQR has co-ordinates P(1,1) Q (1,3) R (3,1)
- a. Plot the triangle in the graph paper provided. **[1 Mark]**
- b. $P'Q'R'$ is the image of PQR under an enlargement scale factor 2 about origin.
- i. Plot $P'Q'R'$ in the graph provided. **[3 Marks]**
- ii. State the co-ordinates of $P'Q'R'$. **[1 Mark]**
- c. $P''Q''R''$ is the image of $P'Q'R'$ under reflection in the $y - axis$. Plot $P''Q''R''$ in the graph paper and state its co-ordinates. **[4 Marks]**
- d. Calculate the area of triangle $P''Q''R''$ **[1 Mark]**
-

22. In each of the following figures, calculate the area of the shaded regions.

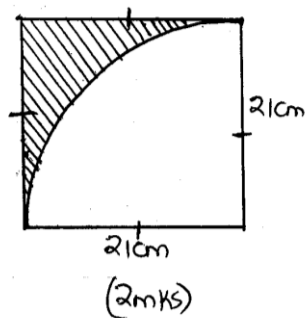
a.



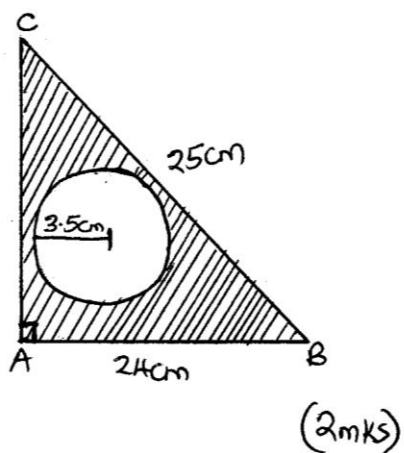
b.



c.



d.



23. Amina bought 3 pens and 2 pencils for shs. 13. Njoki bought 2 similar pens and 1 pencil and spent shs. 5 less than Amina.

a. Form 2 simultaneous equations to represent the above information **[2 Marks]**

b. Using substitution method, determine the price of each item. **[3 Marks]**

c. Migwi bought 100 pencils and 150 pens from the same shop.

i. What was the total cost? **[2 Marks]**

ii. He later sold all the pencils at a profit of 30% and all the pens at a profit of 50%.

Determine the total profit. **[3 Marks]**

24. A bus has a carrying capacity of 52 passengers and a Nissan 14 passengers. Both vehicles were used to ferry people from a village to a church for a wedding function. The distance from the village to church is 80km and the fuel consumption of the bus is 1 litre for every 8km and the Nissan is 1 Litre for every 15 km. Fuel costs shs. 15 per litre. The bus made 5 complete round trips and the Nissan made 8 complete round trips with full capacity. If each passenger was paying shs. 100 to be ferried to the function; Find

i. The total collection made by each vehicle. **[3 Marks]**

ii. The total cost of fuel used by each vehicle. **[2 Marks]**

iii. The net profit made by each vehicle. **[3 Marks]**

iv. The total number of people who were ferried to the function. **[2 Marks]**

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 09

SECTION A (50MKS)

Instructions.

Answer all questions in this section in the spaces provided.

1. Use logarithms to evaluate. **(4mks)**

$$\frac{\sqrt{415.2 \times 0.0761}}{135}$$

2. Three similar bars of length 200 cm, 300cm and 360 cm are cut into equal pieces. Find the largest possible area of square which can be made from any of the three pieces. **(3mks)**

3. A triangle has vertices A(2,5), B(1, -2) and C(-5,1). Determine:

- a) The equation of the line BC. **(3mks)**

- b) The equation of the perpendicular line from A to BC. **(3mks)**

4. The ratio of the radii of two spheres is 2:3. Calculate the volume of the first sphere if the volume of the second is 20cm³. **(3mks)**

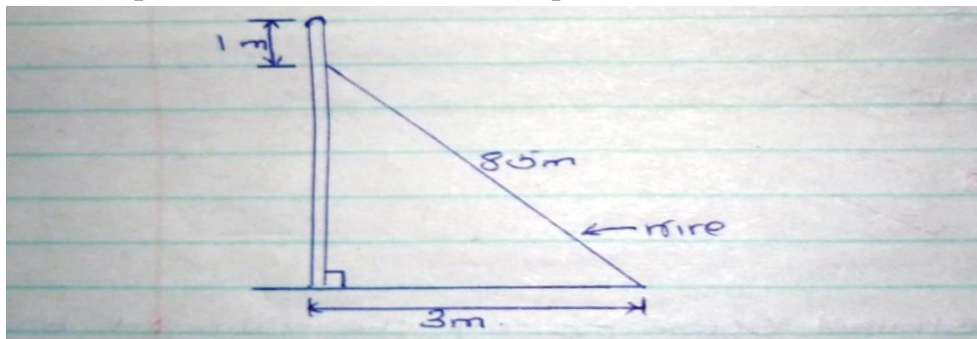
5. Without using a mathematical table or calculator solve the following. **(3mks)**

$$\frac{3\sqrt{0.729 \times 409.6}}{0.1728}$$

6. Three boys shared some money, the youngest boy got $\frac{1}{2}$ of it and the next got $\frac{1}{9}$, and the eldest got the remainder. What fraction of money did the eldest receive? If the eldest got sh 330, what was the original sum of money? **(4mks)**

7. Ten men working 6 hours a day take 12 days to complete a job. How long will it take 8 men working 12 hours a day to complete the same job? **(3mks)**

8. An electric pole is supported to stand vertically by a tight wire as shown below. Find the height of the pole and leave to 2 decimal places. (3mks)



9. From a window 25m above a street, the angle of elevation of the top of a wall on the opposite side is 15° . If the angle of depression of the base of the wall from the window is 35° find:
- The width of the street. (2mks)
 - The height of the wall on the opposite side. (2mks)

10. Simplify: (2mks)

$$\frac{25^{3/2} \times 9^{1/2} \times 2^2}{5^2 \times 3^2}$$

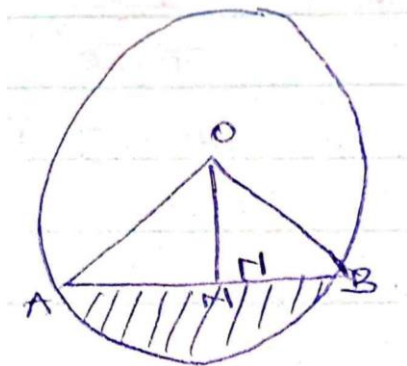
11. Solve the inequality: (3mks)

$$2x - 1 \leq 3x + 4 < 7 - x$$

12. Solve the following: (3mks)

$$x^2 + 3x - 54 = 0$$

13. The figure below shows a circle with centre O and radius 5cm. if $ON = 3\text{cm}$, $AB = 8\text{cm}$ and $\angle AOB = 106.3^\circ$. Find the area of shaded region. (3mks)



14. Expand and simplify: (2mks)
 $4(q + 6) + 7(q - 3)$

15. The length of a rectangle is three times its breadth. If its perimeter is 24cm what is the length of the rectangle. (2mks)

b) Area of rectangle. (2mk)

SECTION B

Answer any two questions.

16. A rectangular tank whose internal dimensions are 1.7m by 1.4m by 2.2m is filled with milk.
a) Calculate the volume of milk in the tank in cubic metres. (2mks)

b) The milk is to be packed in small packets. Each packet is in the shape of a right pyramid on an equilateral triangular base of side 16cm. The height of each packet is 13.6cm. Calculate the volume of milk contained in each packet. (3mks)

ii. If each packet was to be sold at sh 25 per packet, what is the sale realized from the sale of all exact packets of milk. (5mks)

17. A triangle ABC with vertices A(-2,2), B (1, 4) and C(-1, 4) is mapped on to triangle A'B'C' by a reflection in the line $y=x+1$.

a. On the grid provided draw:

i. Triangle ABC (1mk)

ii. The line $y=x+1$ (2mks)

iii. Triangle A'B'C' (3mks)

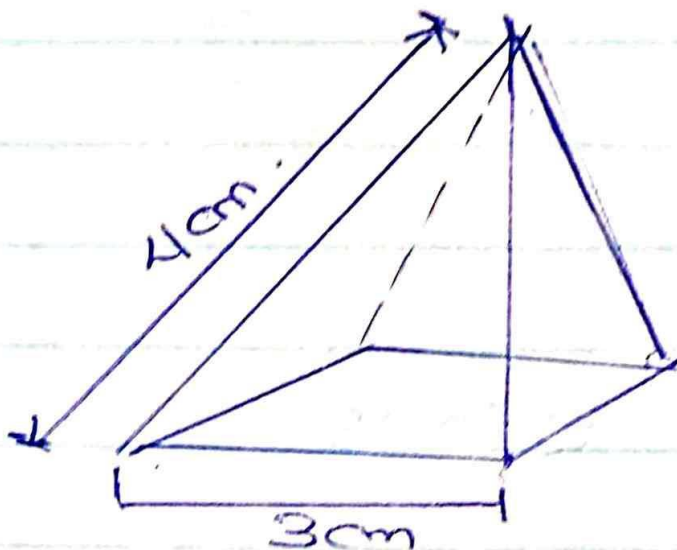
b. Triangle A''B''C'' is the image of triangle A'B'C' under a negative quarter turn, with the centre of rotation as origin (0, 0). On the same grid draw triangle A''B''C'' (4mks)

18. The following measurements were obtained while measuring a coffee field. The measurements were entered in a field book as follows:

	Y	
	360	80 to Q
	280	
To R 80	200	
To S 160	80	200 to P
	X	

- Taking the baseline $XY = 400$ m. draw the map of the coffee field using a scale of 1cm represents 40m.
- Calculate the area of the coffee field. (5mks)

19. The figure below represents a right pyramid. On a square base of side 3cm. the slant edge of the pyramid is 4cm.



- Draw the net of the pyramid. (2mks)
- Calculate the surface area of the pyramid. (4mks)
- Calculate the volume of the pyramid to 2 decimal places. (4mks)

FORM TWO HOLIDAYS KEYNOTE

MATHEMATICS QUESTION PAPER NO: 10

SECTION I (50 Marks)

Answer ***all*** the questions in this section

1. George spends five-eighths of his salary on food, one-sixth of the remainder on school fees, two-thirds of what remains on contingencies and saves Kshs. 6,000. Calculate George's monthly salary. **(3 marks)**

2. (a) Find the GCD of 1240 and 860 **(1 mark)**

(b) Hence find the number of square tiles that can be used to cover a floor of dimensions 12.4 m by 8.6 m **(2 marks)**

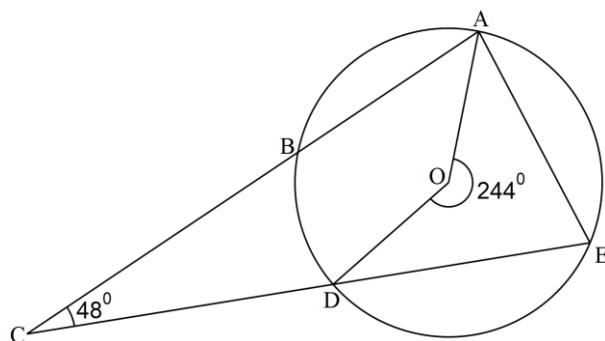
3. Without using a mathematical table or a calculator, find the values of a and b given that: **(3 marks)**
$$\frac{0.0168 \times 2.46 \times 7}{5.74 \times 0.0112} = \frac{a}{b}$$

4. Ten years ago, Mary was twice as old as her daughter Ruth. If the sum of their ages now is 56 years, calculate their present ages. **(3 marks)**

5. Simplify the expression below **(3 marks)**
$$\frac{2x - 3y + 4x^2 - 6xy}{1 - 4x^2}$$

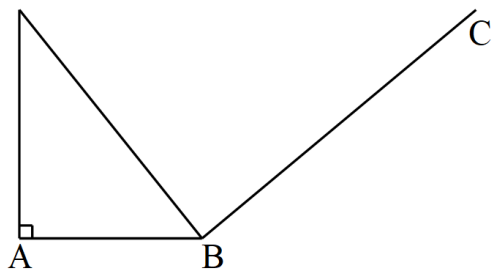
6. A rectangular plot of land measures 120 m by 50 m. One of the longer sides has a wall already erected along it. The plot is to be fenced using chain link. One roll of chain link measures is 16 m long. A gate 6 m wide is left on one of the shortest sides. Calculate the number of rolls of chain link required to completely fence the plot. **(3 marks)**

7. In the figure below, O is the centre of the circle. The reflex $\angle AOD = 244^\circ$ and $\angle BCD = 48^\circ$.



Calculate the size of $\angle BDC$ (3 marks)

8. The figure below shows a face and an edge of a triangular prism ABCDEF.



Complete the prism, labeling it accordingly and showing the hidden lines as broken. (2 marks)

9. Use tables of logarithms only to evaluate (4 marks)

$$\sqrt[3]{\frac{0.2103 \tan 89.4^\circ}{74.6^2}}$$

10. Evaluate without using mathematical tables (3 marks)

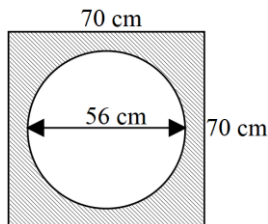
$$(125)^{\frac{2}{3}} \times \left(\frac{625}{64}\right)^{-\frac{1}{2}}$$

11. A tourist arrived in Kenya with Great Britain Pounds (GBP) 8,640 all of which she exchanged into Kenya Shillings. He spend Kshs. 517,906 while in Kenya and converted the rest of the money into US dollars (USD). Use the exchange rates below to calculate the amount of money he received to the nearest USD. (3 marks)

Currency	Buying (Kshs.)	Selling (Kshs.)
1 GBP	145.40	154.29
1 USD	104.61	111.00

12. Two similar cups have capacities of 1 litre and 343 cm^3 . The surface area of the smaller cup is 122.5 cm^2 , calculate the surface area of the larger cup. (3 marks)

13. The figure below shows the cross-section of a solid equipment used in a construction firm. It comprises of a circular hole of diameter 56 cm drilled on to a square of side 70 cm. The solid is 1.5 m long



- Calculate the volume of the solid in m^3 . Use $\pi = \frac{22}{7}$ (4 marks)

14. Find the modulus of the **AB** given that $\mathbf{a} = -4\mathbf{i} - 7\mathbf{j}$ and $\mathbf{b} = 3\mathbf{i} - 8\mathbf{j}$ correct to 2 decimal places. (3 marks)

15. Use a ruler and pair of compasses only in this question.

Construct a trapezium PQRS such that $PQ = 7.4 \text{ cm}$, $\angle PQR = 105^\circ$, $\angle SPQ = \angle RSP = 90^\circ$, $PS = 5.3 \text{ cm}$ and PQ parallel to SR. (4 marks)

16. Show on a number line the range of all integral values of x which satisfy the following pair of inequalities. (3 marks)

$$3 - x \leq 1 - \frac{1}{2}x$$

$$-\frac{1}{2}(x - 5) < 7 - x$$

SECTION II (50 Marks)

Answer *any five* questions in this section

17. Four schools, **K**, **L**, **M** and **N** are such that **L** is on a bearing of 055° and a distance of 8.5 km from **K**. **M** is 7.2 km from **L** on a bearing of 144° . **N** is 5 km due south of **M**. A campsite **P** is due west of **N** and on a bearing of 159° from **K**

- (a) Using a scale of 1: 100,000 make a scale drawing to show the relative positions of **K**, **L**, **M**, **N** and **P** (5 marks)
- (b) Use the scale drawing in (a) above to find:
- (i) The distance between **K** and **M** (2 marks)
- (ii) The bearing on **P** from **L**. (1 mark)
- (c) Show the position **T** of a communication mast installed such that it is equidistant from **K**, **N** and **P**. (2 marks)
18. (a) The ratio $a : b = 2 : 3$ and the ratio $b : c = 2 : 5$. If the sum of the three quantities is 2,050, calculate the difference between quantities c and a . (4 marks)

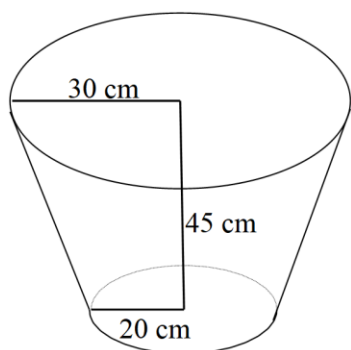
(b) Two business partners Eric and Bryan contributed Kshs. 100,000 and Kshs. 120,000 respectively to start a tech firm. They agreed that 30% of the proceeds from the firm would be shared in the ratio of their contributions and another 30% shared equally. At the end of the year, the business realized a profit of Kshs. 198,000

Calculate:

(i) The amount of money they shared (2 marks)

(ii) The amount received by each. (4 marks)

19. The figure below shows a solid drum that is in the shape of a frustum of a cone with top and bottom radii as 30 cm and 20 cm respectively. The drum is 45 cm high.



(a) Calculate the height of the original cone from which the drum was made. (2 marks)

(b) Calculate to 2 decimal places, the surface area of the drum. Use $\pi = 3.142$ (8 marks)

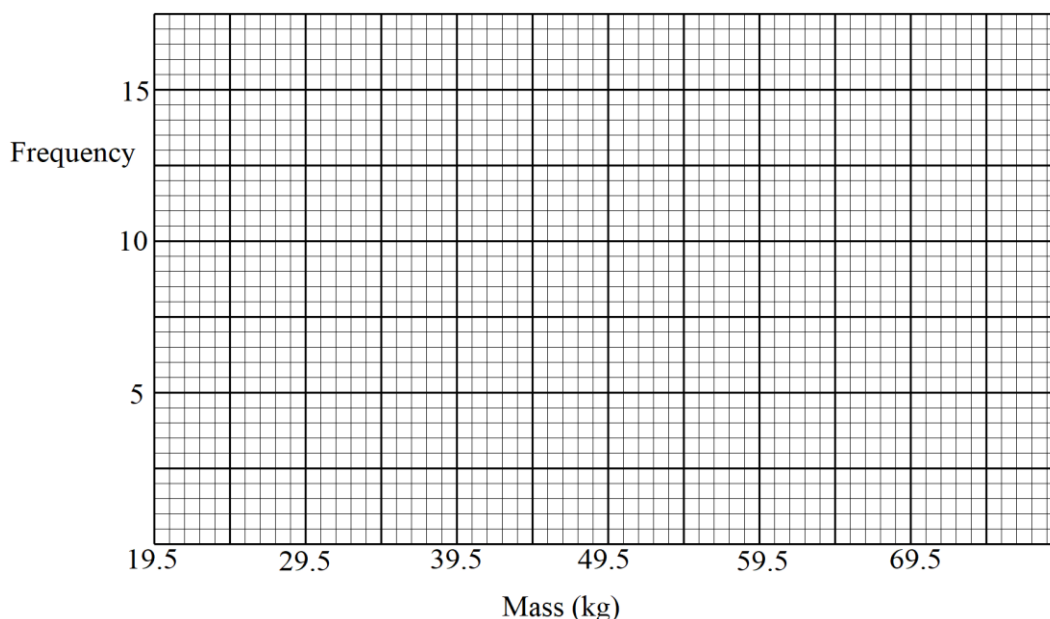
20. Below are masses of students taken in a medical centre.

35	55	32	37	60	35	38
20	54	66	59	34	56	42
31	44	47	45	55	48	39
29	27	24	33	36	35	43
45	48	28	52	39	64	41

(a) Starting with the class 20 – 29 and class size of 10, make a frequency distribution table for the data. (2 marks)

(b) Calculate the mean mass **(4 marks)**

(c) (i) On the grid provided, draw a histogram to represent the data above **(2 marks)**



(ii) On the histogram, draw a line to estimate where the median mass lies. **(2 marks)**

21. (a) Calculate the time in seconds it takes a bus 5 m long and moving with a speed of 60 km/h to go past a truck 15 m long and heading in the opposite direction with a speed of 50 km/h if the distance between the bus and the truck is 200 m **(3 marks)**

(b) A bus left Eldoret at 7.12 a.m. towards Nairobi at an average speed of 72 km/h. At 8.22 a.m., a car left Eldoret for Nairobi at an average speed of 100 km/h. The distance between Nairobi and Eldoret is 348 km.

Calculate:

(i) The time of the day when the car caught up with the bus. **(4 marks)**

(ii) The distance from Nairobi where the car caught up with the bus. **(3 marks)**

22. A youth group plans to buy a branding machine at a cost of Kshs. 72,000 by contributing equal amount of money. Before they contribute, 3 new members join the group, and as such each of the members has to contribute Kshs. 1,200 less.

- (a) By taking x as the original number of members of the group, write an expression for:
- (i) The original amount to be contributed by each member (1 mark)
- (ii) The amount contributed by each member after the new members join (1 mark)
- (b) Find the total members who contributed. (6 marks)
- (c) At the end of the year, the machine realized a profit Kshs. 337,500. The profit was shared equally among the members. Calculate the amount of money received by each member of the group. (2 marks)

23. Triangle T has coordinates $A(-2, -2)$, $B(-5, -5)$ and $C(0, -4)$. T^1 is the image of T after a transformation M such that $A'(2, 2)$, $B'(5, 5)$ and $C'(4, 0)$

- (a) (i) On the same pair of axes, draw triangles T and T^1 (2 marks)
- (ii) Describe the transformation M fully (2 marks)
- (b) T^2 is the image of T^1 after a rotation of $+90^\circ$ about $(1, 1)$. Draw T^2 on the same axes and state its coordinates (3 marks)
- (c) T^3 is the image of T^2 under a translation described by vector $\begin{pmatrix} 5 \\ -7 \end{pmatrix}$.
- (i) Draw T^3 (2 marks)
- (ii) Which pair of the triangles exhibit opposite congruency? (1 mark)

24. A straight line L_1 passes through the points $(-2, 8)$ and $(4, -4)$

- (a)(i) Find the equation L_1 in the form $ax + by = c$, where a , b and c are integral values. (3 marks)
- (ii) L_1 crosses the x-axis at point P, determine the coordinates of P. (2 marks)
- (b) (i) Another line L_2 is perpendicular to L_1 through point P. Determine the y-intercept of L_2 . (3 marks)
- (ii) Determine the angle L_2 makes with the x-axis correct to 2 decimal places. (2 marks)

**CALL AMOBI GROUP OF EXAMINERS @
0743 333 000 OR 0706 851 439 TO
ACQUIRE :**

