NAME: ……

INDEX NO: ……

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CANDIDATES SIGNATURE……

DATE:……

INSTRUCTIONS TO CANDIDATES

a) *Write your name and index number in the spaces provided above.*
b) *Sign and write the date of examination in the spaces provided*
c) *This paper consists of two sections:* ***Section I and Section II.***
d) *Answer all the questions in Section I and only five from section II.*
e) *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
f) *Marks may be given for correct working even if the answer is wrong.*
g) *Non- programmable silent electronic calculators* ***and KNEC*** *Mathematical tables may be used except where stated otherwise.*
h) *Candidates should check the question paper to ascertain that all the pages are printed as*
i) *Candidates should answer the questions in English .*

For Examiner's Use Only

SECTION I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

SECTION II

17	18	19	20	21	22	23	24	Total

Grand Total

- This paper consist of 16 printed papers

SECTION 1 (50 MARKS)

ANSWER ALL THE QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED.

1. Without using mathematical tables or a calculator evaluate

$$\sqrt{\frac{0.3-0.098 \div (0.84-0.14)}{(0.28+0.12) \div 0.8 \times 0.5}}$$

Leaving the answer as a decimal (3 marks)

2. Two straight highways cross at a right angle at point **X**. The first highway and the second meet a straight by-pass at point **Y** and **Z** respectively. If **YZ** is 150km and **XZ** is 70km. Find **XY**, to one decimal place. (3 marks)

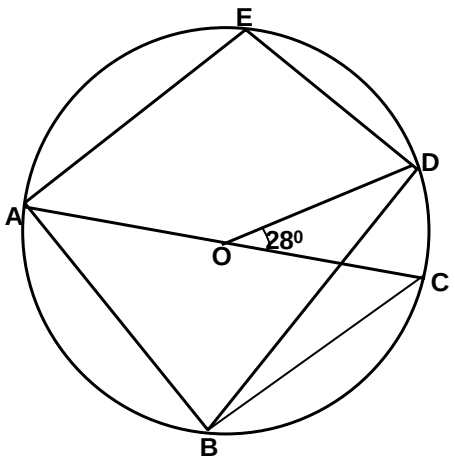
3. Factorize $4PK - 9 + 13p^2k^2$ (2marks)

4. The marked price of a revision textbook in a certain bookshop is Kshs, 850. Wilson bought two

dozens of the revision books at a discount of 15%. He sold all of them on the streets making a profit of 25%. Determine the total sales. (3 marks)

5. The size of each interior angle of a regular polygon is one and a half times the size of the exterior angle. Find the number of sides of the polygon. (3 marks)

6. In the figure below AOC is a diameter of a circle centre O. ABDE is a cyclic quadrilateral and angle COD = 28^o.
Determine the size of
(a) Angle AED (2 marks)



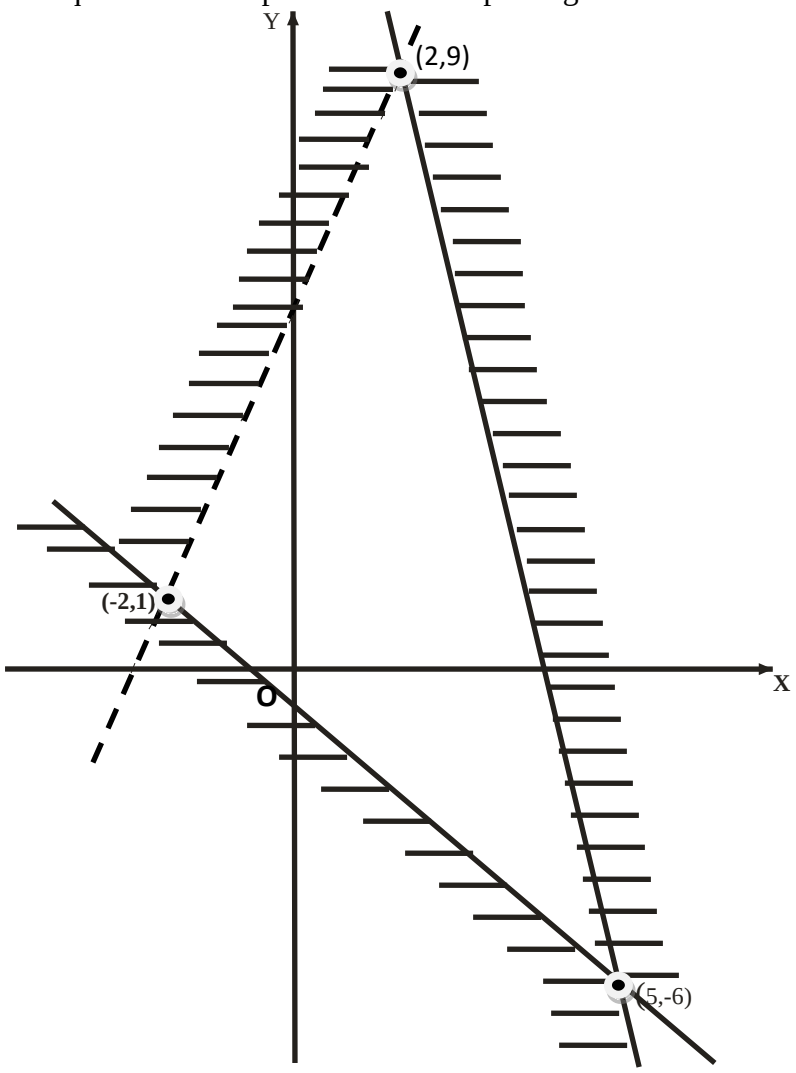
(b) Angle CAD (2 marks)

7. Given that θ^o is an acute angle and $\tan \theta^o = 1\frac{1}{3}$, find without using tables or a calculator $\cos (90-\theta)^o$ (2 marks)

8. Solve for y (4marks)

$2^{2y+1} - 6\,(2^{y-1}) + 1 = 0.$

9. State the inequalities that represent the unshaped region (3 mark)

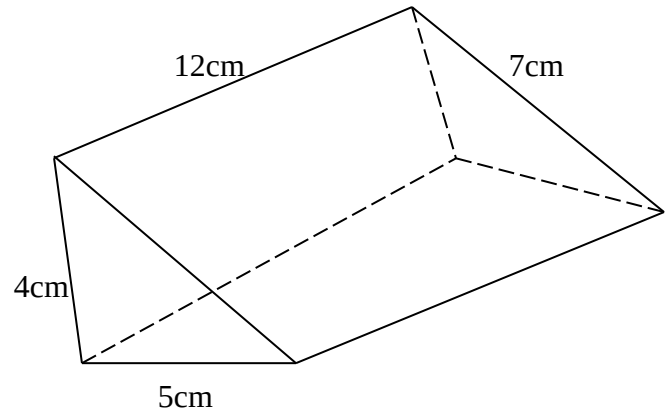


10. The position vector of A and B are a = $4\underset{\sim}{i} + 2\underset{\sim}{j} - 5\underset{\sim}{k}$ and b = $2\underset{\sim}{i} + \underset{\sim}{j} - \underset{\sim}{k}$ respectively.

Find the magnitude of AB (3 marks)

11. A straight line L_1, has its equation as $2x + 3y = 6$. Find the equation of a line L_2 through point (-4,5) and parallel to L_1, in the form $y = mx + c$ (3 marks)

12. The figure below show a prism 12cm long. The cross-section is a triangle of sides 4cm, 5cm and 7cm .



Calculate the surface area of the prism (3marks)

13. In a period of two years Kamau paid a simple interest of Kshs.3500 for kshs.5000 borrowed from Tumaini Bank while Otieno paid a simple interest of Kshs.5600 for Kshs.8000 borrowed from the same bank. For the same period Kamau paid a simple interest of Kshs.1440 for Kshs.3000 borrowed from Endelea Bank, while Otieno paid a simple interest of Kshs.2400 for Kshs.5000

borrowed from the same Bank.
Determine t he rate of interest charged by each Bank. (4 marks)

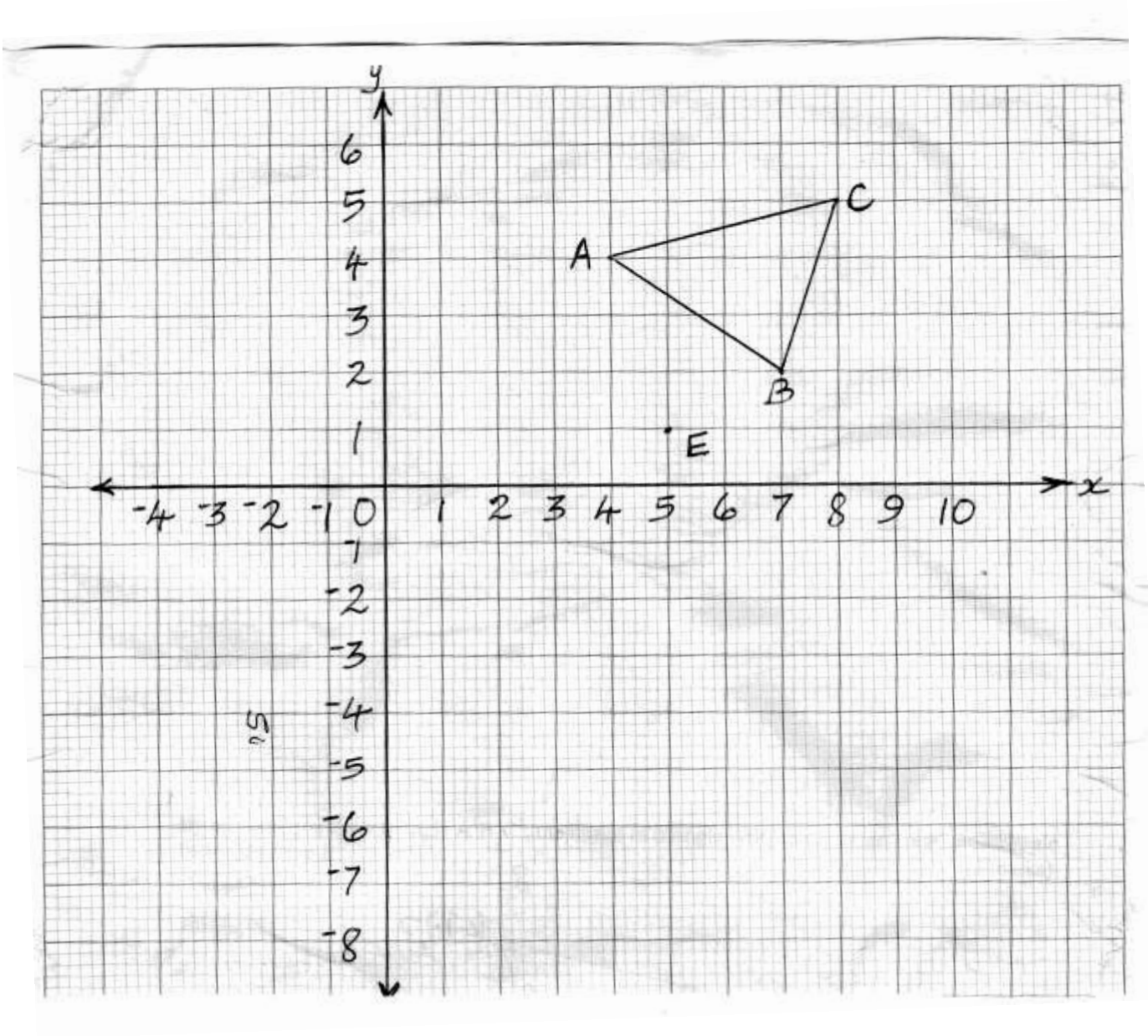
14. During a P.E. lesson Sheila stood 50m east of Edna. Both were facing the teacher who was on a bearing of 045º from Sheila and 065º from Edna. Determine Sheila's distance from the teacher to 2 decimal places. (4 marks)

15 The following data represents the enrolment of students in 12 colleges

564	553	566	554	563	563
657	556	553	554	651	559

Find the quartile deviation (3 marks)

16. The diagram below shows triangle ABC with vertices A (4, 4), B (7, 2) and C (8, 5)



By construction draw triangle $A^1B^1C^1$, the image of triangle ABC under enlargement linear scale factor $^-2$ centre E (3 marks)

SECTION II (50 MARKS) ANSWER FIVE QUESTIONS ONLY IN THIS SECTION

17 Four businesswomen decided to buy a building. An agent was selling the building at Kshs.3,800,000 on behalf of the owner, plus a facilitation fee of 10% of the value of the building to be paid by the buyers. The agreement was that the buyer would first pay a deposit of 55% of the total cost and the balance to be paid in one month's time.

(a) Find,

(i) The amount of deposit paid (3 marks)

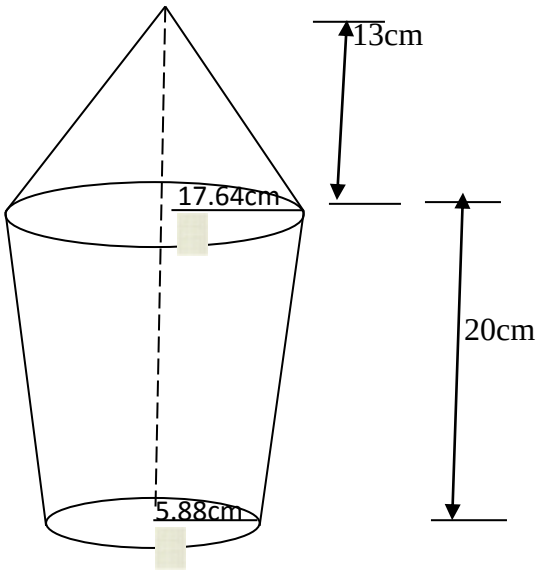
(ii) The balance to be paid in one month's time (2 marks)

(b) The balance was paid in the ratio 1:2:3:5. Calculate:

(i) The money paid by the second highest contributor (2 marks)

(ii) The difference between the money paid by the highest and lowest contributors (3 marks)

18. The figure below shows a solid made up of a conical frustum and a conical top. The dimensions are as indicated in the figure.



Find

(a) The curved surface area of the conical top (2 marks)

(b) The curved surface area of the frustum (4 marks)

(c) The volume of the solid (4 marks)

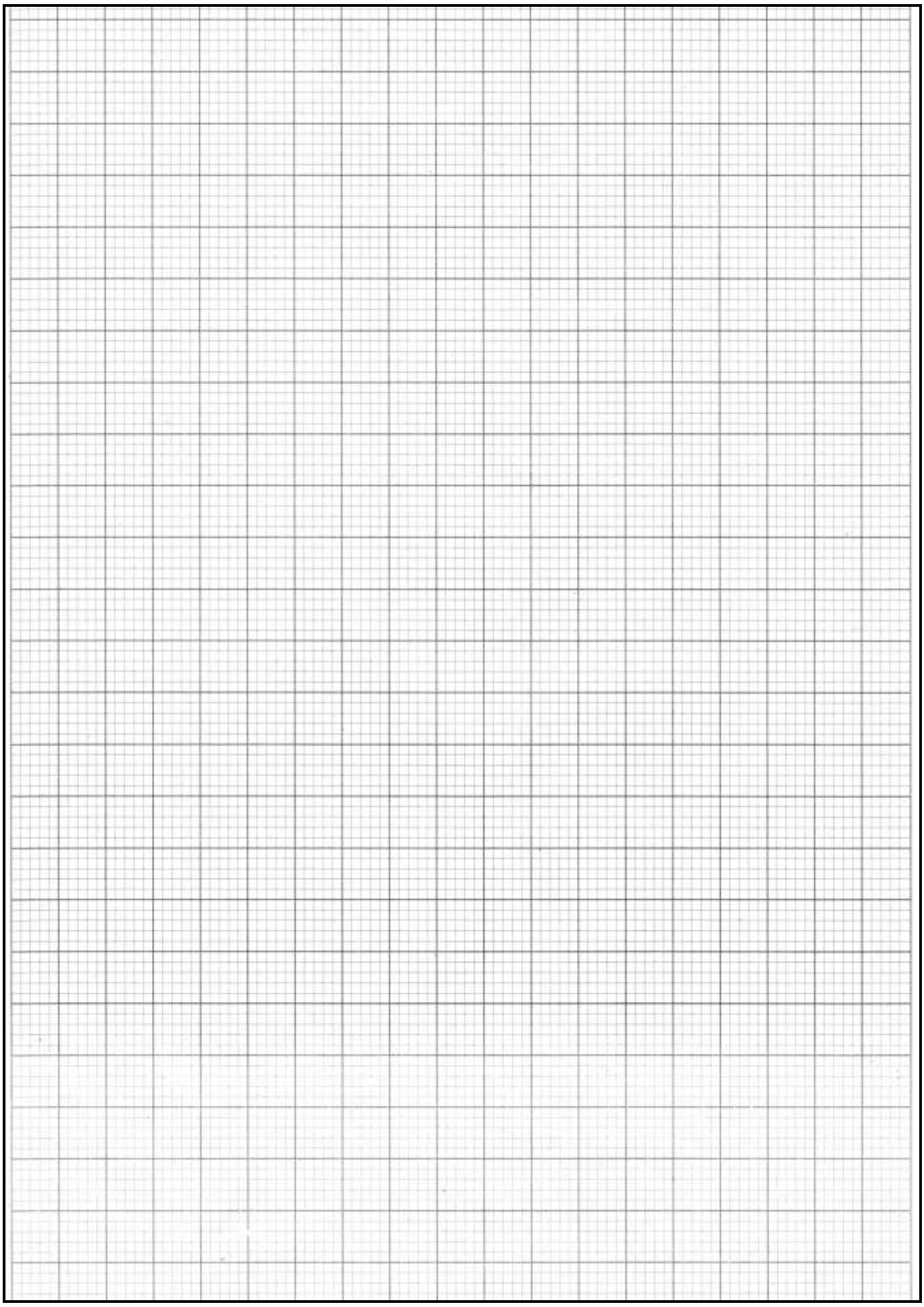
19.(a) Complete the following table for the equation $Y= x^3 + 2x^2 – 3x - 3$ (2 marks)

x	-4	-3	-2	-1	0	1	2	3
x^3	64			-1	0	1	8	27
$2x^2$	32	18	8	2	0	2	8	18
-3x		9		3	0	-3		-9
-3	-3	-3	-3	-3	-3	-3	-3	-3
y		-3	3			-3	7	

(b) On the grid provided draw the graph of $y= x^3 + 2x^2 – 3x - 3$ for $-4 \leq x \leq 3$. Use 2cm to represent I unit on the x-axis and 1cm to represent 5 units on the Y-axis. (3 marks)

(c) (i) Use the graph to estimate the roots of the equations $x^3 + 2x^2 – 3x - 3 = 0$ (2 marks)

(ii) By drawing a suitable line use the graph in (b) above to obtain the roots of the equation $-x^3 - 2x^2 + 5x + 8 = 0$ (3 marks)



20 Sally bought some mangoes worth Kshs.60, while Peris spent kshs.60, but bought them at a discount of 50cents per mango.

(a) If Sally bought a mango at sh. X. write down a simplified expression for the total number of mangoes bought by

(i) Sally (1 mark)

(ii) Peris (1 mark)

(b) If Peris bought **3** more mangoes than Sally. Find how much each spent on a Mango (to the nearest cents) (5 marks)

(c) Find the total number of mangoes bought by Sally and Peris (to the nearest whole number) (3 marks)

21 A plastic model of a tank, open at the top is in the shape of a cylinder. The internal radius of its base is **r** cm and its internal height is **h** cm. The total internal surface area of the tank is

1386 cm^2.

(a) Write an expression for the total internal surface area of the tank (1 mark)

(b) Express in terms of **r**

(i) The internal height of the tank (2 marks)

(ii) The internal volume of the tank (1mark)

(c) Determine

(i) The value of **r** for which the internal volume, **V** is maximum (4 marks)

(ii) The maximum internal volume of the tank (2 marks)

22 A plane **P** is 16500 km on a bearing of **N** 30^o E from an international airport. Another plane **Q** is 9,900km on a bearing of **S** 60^o**E** from plane **P**. Plane **R** is 23,000km due south of the airport.

(a) Using a scale of 1cm to represent 3000km, show the relative positions of **P, Q R** and the airport. (3 marks)

(b) Find the distance and bearing of **R** from **Q** (3 marks)

(c) If **Q** and **P** are both travelling at 4000km/hr towards the airport. Calculate the difference in the time taken to reach the airport by the two planes, to the nearest hour. (4 marks)

23 The frequency distribution table below shows the K.C.P.E. marks obtained by peoples in a certain school.

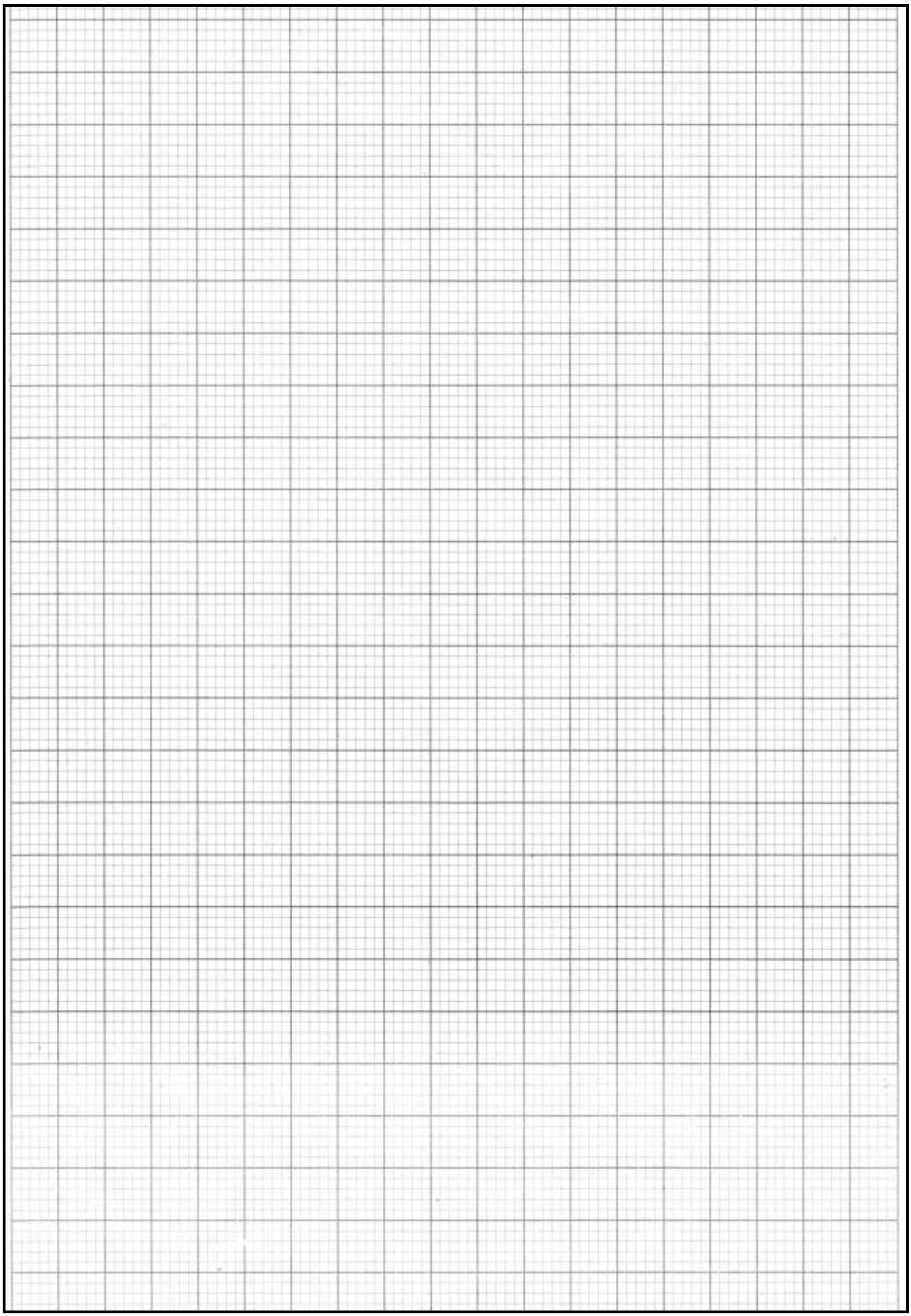
Marks	number of peoples
$200 \leq x \leq 220$	6
$220 \leq x \leq 240$	14
$240 \leq x \leq 280$	12
$280 \leq x \leq 320$	8
$320 \leq x \leq 340$	5

(a) Estimate the mean marks of the peoples (4 marks)

(b)(i) On the grid provided, draw a histogram to represent the information above (3 marks)

(c))i) State group in which the median mark lies (1mark)

(ii) A vertical line drawn through the median mark divides the total area of the histogram into two equal parts. Using this information or otherwise, estimate the median mark (2 marks)



24. Triangle ABC has the vertices A (3, 1), B (2, 2) and C (3, 4).

(a) On the grid provided draw triangle ABC and its image $A^1B^1C^1$ under a rotation of negative quarter turn about the point (0,0) (3 marks)

(b) (i) Draw triangle $A^{11}B^{11}C^{11}$ the image of Δ $A^1B^1C^1$ under a reflection in the line y = -x 2 marks)

(ii) Describe fully the transformation that maps $\Delta A^{11}B^{11}C^{11}$ onto ΔABC (2 marks)

(c) (i) On the same axes draw triangle $A^{111}B^{111}C^{111}$ the image of Δ $A^{11}B^{11}C^{11}$ under a translation given by translation Vector $\begin{bmatrix} -6 \\ 1 \end{bmatrix}$ (2 marks)

(iii) State the co ordinates of $\Delta A^{111}B^{111}C^{111}$ (1 mark)