NAME:……..INDEX NO:……
CANDIDATE'S SIGNATURE:……
DATE:……

121/1
MATHEMATICS
JULY, 2018
PAPER 1
TIME: 2½ HOURS

BUURI EAST STANDARDS

Kenya Certificate of Secondary Education
MATHEMATICS Alt. A
2 ½ Hours

Instructions to candidates.

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of the examination in spaces provided above.
(c) This paper consists of two sections: Section **I** and **II**.
(d) Answer ***all*** the questions in section I and ***only five*** questions from section II.
(e) Show ***all*** the steps in your calculations, giving your answer at each stage in the space provided.
(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 no questions are missing.***
(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

SECTION I (50 MARKS): <u>Answer all the questions in this section in the spaces provided.</u>

1. Without using a calculator evaluate. (3 marks)

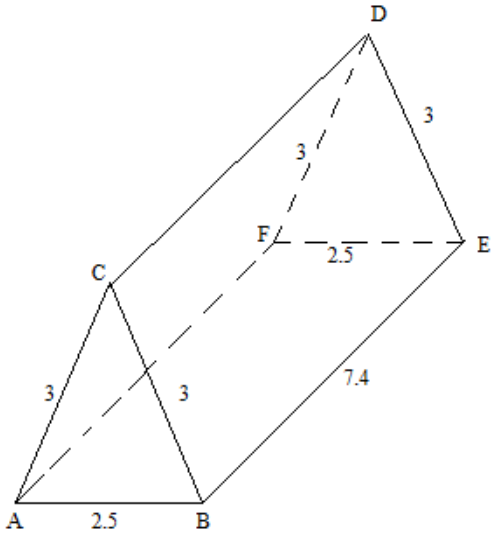
$$\frac{-4(3+1)-18\div 6+5}{-3\times -6+-1\times 11}$$

2. The distance between Jane's home and her school is $^{4}/_{5}$ of 8km. One day she run ¼ of the way and walked the rest of the journey. What distance did she walk? (3 marks)

3. Otiende works for a coffee processing company as a sales man. He is paid on Monthly basis as per agreement below.
   a) A basic pay of sh. 20,000 per Month.
   b) A commission of 2% for goods sold up to a maximum of sh. 200,000.
   c) A commission of 4% for goods sold over sh. 200,000 in that Month.

   In a certain Month he sold goods worthy sh. 600,000. Calculate his total pay for that Month. (3 marks)

4. Draw the net of the solid shown in the figure below. Measurements are in centimeters. (3 marks)



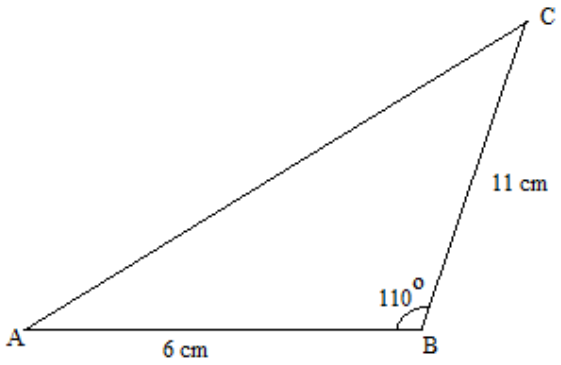
5. Solve for Y in the equation. $8^{y+1} - 2^{3y+1} = 48$ (3 marks)

6. Simplify the expression; $\frac{12x^2+ax-6a^2}{9x^2-4a^2}$ (3 marks)

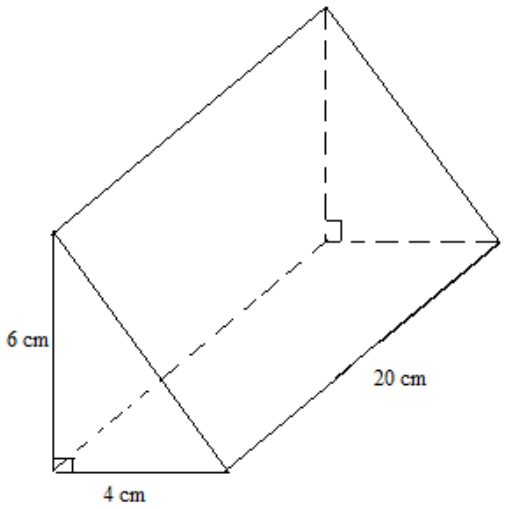
7. A line P whose equation is $y = {}^{1}/_{3}x + 4$ is parallel to another line Q. Find The equation of line Q in the form $y = mx + c$ given that it passes through Point (3, 6) (3 marks)

8. Simplify without using tables or calculators; $\frac{1}{1-\sin 45^0}$ (3 marks)

9. The figure below shows a triangle ABC in which AB = 6cm, BC = 11cm and angle ABC = 100^0. Calculate to the decimal places the length of AC. (3 marks)

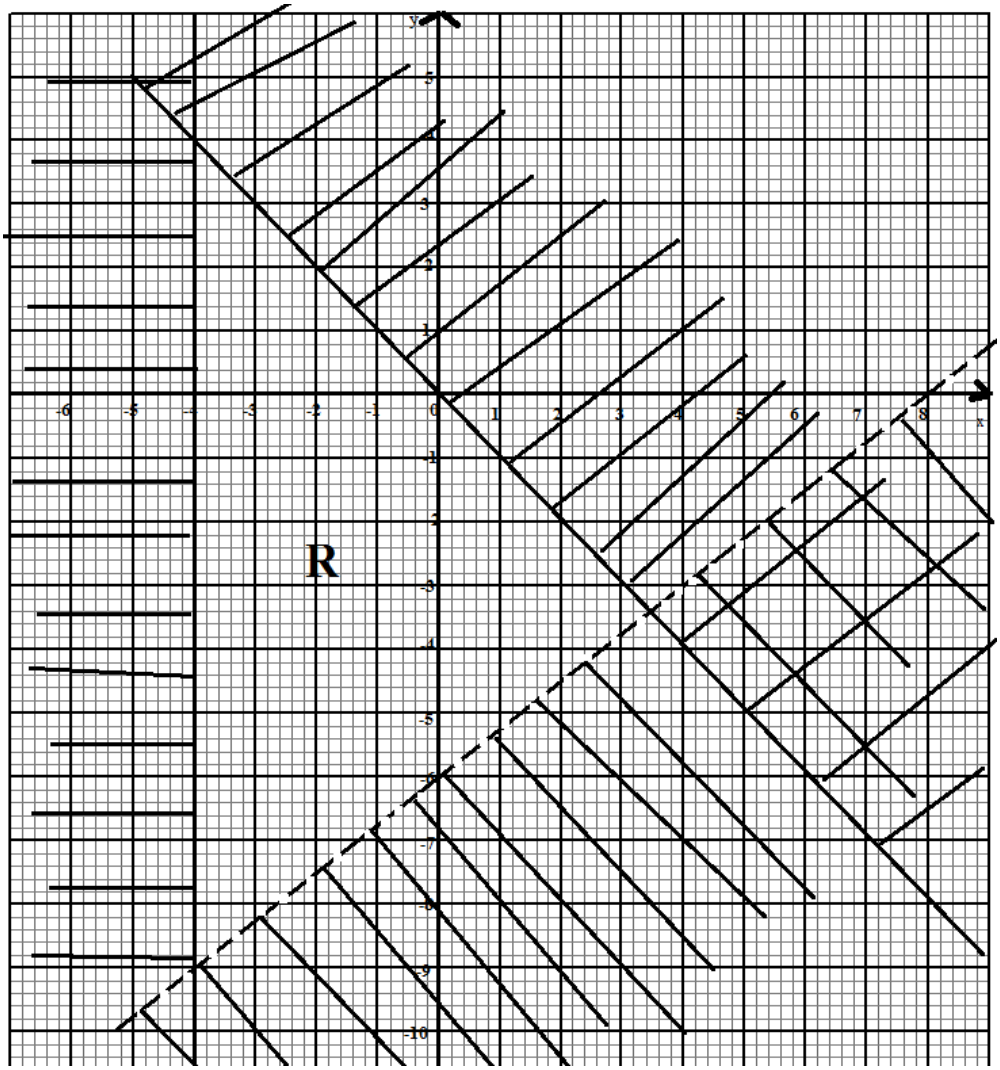


10. The figure below shows a triangular – based pyramid. If the solid is made up of a material of density 1.25g/cm^3, calculate the mass of the solid. (3 marks)



11. A football match between Arsenal FC and Chelsea FC started at 1500hrs. It lasted for the official 90 minutes with a half time break of 15 minutes. The Referee added five extra minutes for injuries and other stoppages. Find the time the match ended. (3 marks)

12. Write down the inequalities that satisfy the unshaded region labelled R. (3 marks)



13. The width of a rectangular hall of Ruiri Girls Secondary School is 16m less than its length. Calculate the length of the hall if its area is $132m^2$. Hence calculate its perimeter. (4 marks)

14. Town A is 80km due east of town B. Town C is on a bearing of 234^0 form town B. If town C is 100km from town A, by scale drawing find the distance of town C from town B. (4 marks)

15. a) Find the inverse of the matrix $\begin{pmatrix} 7 & 4 \\ 3 & 2 \end{pmatrix}$. (1 mark)

b) Using matrix method, solve the simultaneous equations. (2 marks)

$$7x + 4y = 14$$
$$3x + 2y = 8$$

16. Use tables of square roots and reciprocals to find the value of *x*. (3 marks)

$$x = \sqrt{\frac{1}{15.36} + \frac{3}{1.302}}$$

SECTION II(50 marks). Answer *only five* questions in this section in the spaces provided.

17. a) On the grid provided draw the quadrilateral PQRS whose vertices are P (-5, 4), Q(-3, 4), R (-5, 3) and S (-4, 3). (1 mark)

b) On the same grid draw:-

i) P'Q'R'S' the image of PQRS under a reflection in the line $y = 0$ (2 marks)

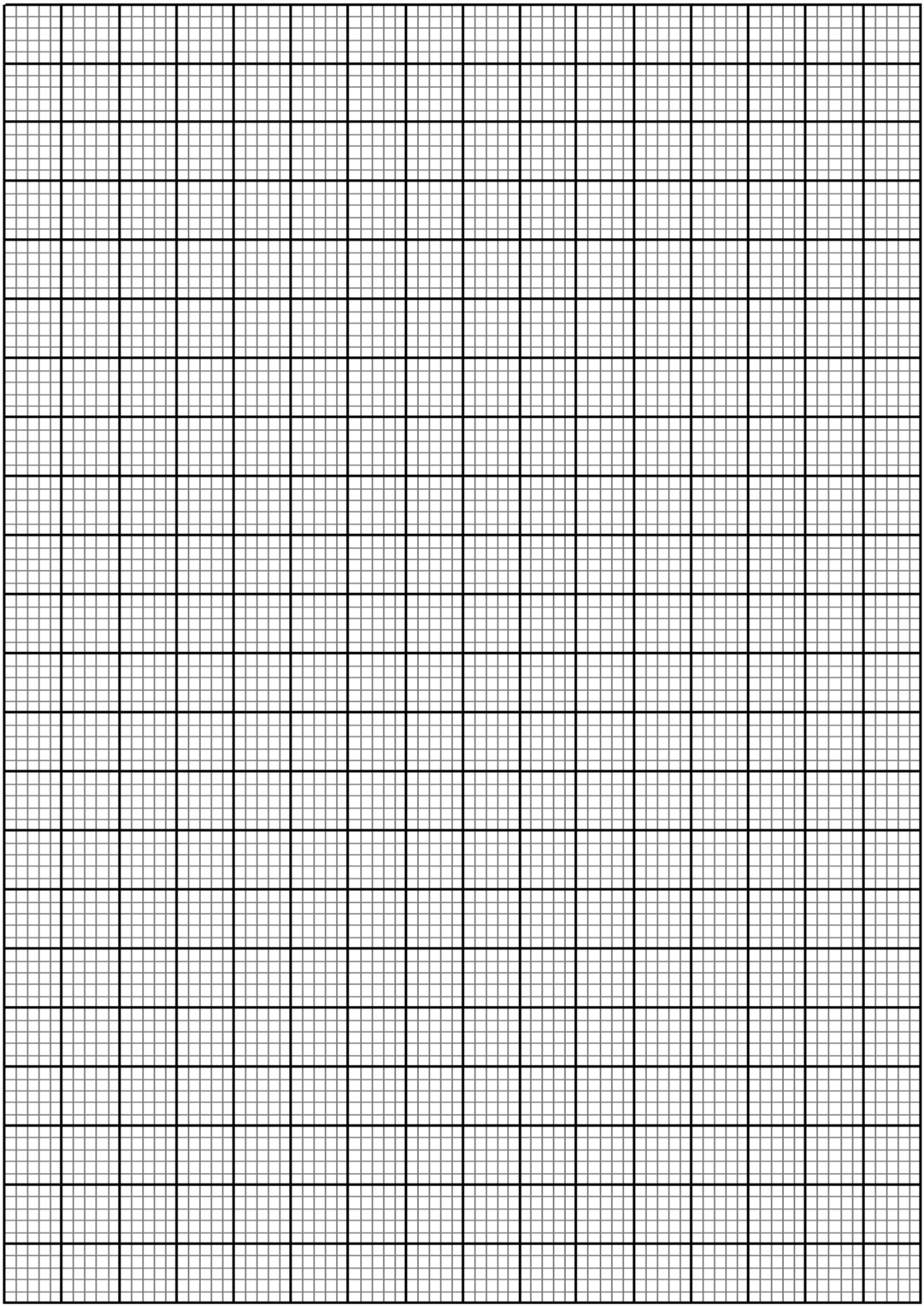
ii) P"Q"R"S" the image of P'Q'R'S' under a rotation of + 180^0 about (0,0) (2 marks)

iii) P"'Q"'R"'S"' the image P"Q"R"S" under an enlargement scale -2, centre (4, 0) (2 marks)

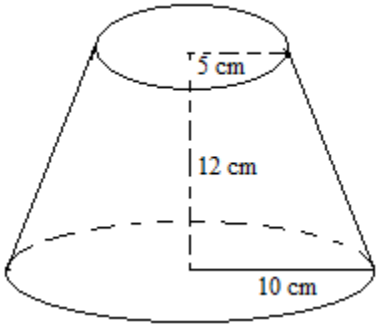
c) Name the quadrilaterals that are

i) Directly congruent (1 mark)

ii) Oppositely congruent (2 marks)



18. The figure below shows a frustrum. The top and bottom radii are 5cm and 10cm respectively, while the vertical height of the frustrum is 12cm.



Find the:-

a) Slant height of the frustum. (3 marks)

b) Curved area of the frustum. (3 marks)

c) Volume of the frustum. (4 marks)

19. Kiriari is a market centre 600km from Kisumu town.
A bus starts from Kisumu for Kiriari at 7.00am at an averge speed of 80 km/h. At 8.30 am a car started from Kisumu to Kirari and moved at an average speed of 120 km/hr.

i) The distance bus covered before the car started moving. (3 marks)

ii) The relative speed for the two vehicles. (2 marks)

iii) The time the car overtook the bus. (1 mark)

iv) Distance covered by the car before overtaking the bus. (2 marks)

v) Distance from Kiriari to the car at the time the car was overtaking the bus. (2 marks)

20. The height of 36 student in a class was recorded to the nearest centimeter as follows:-

148	159	158	163	166	155	155	179	158
161	160	157	165	165	175	173	172	178
147	168	157	172	165	154	170	157	167
155	159	173	171	168	160	172	156	167

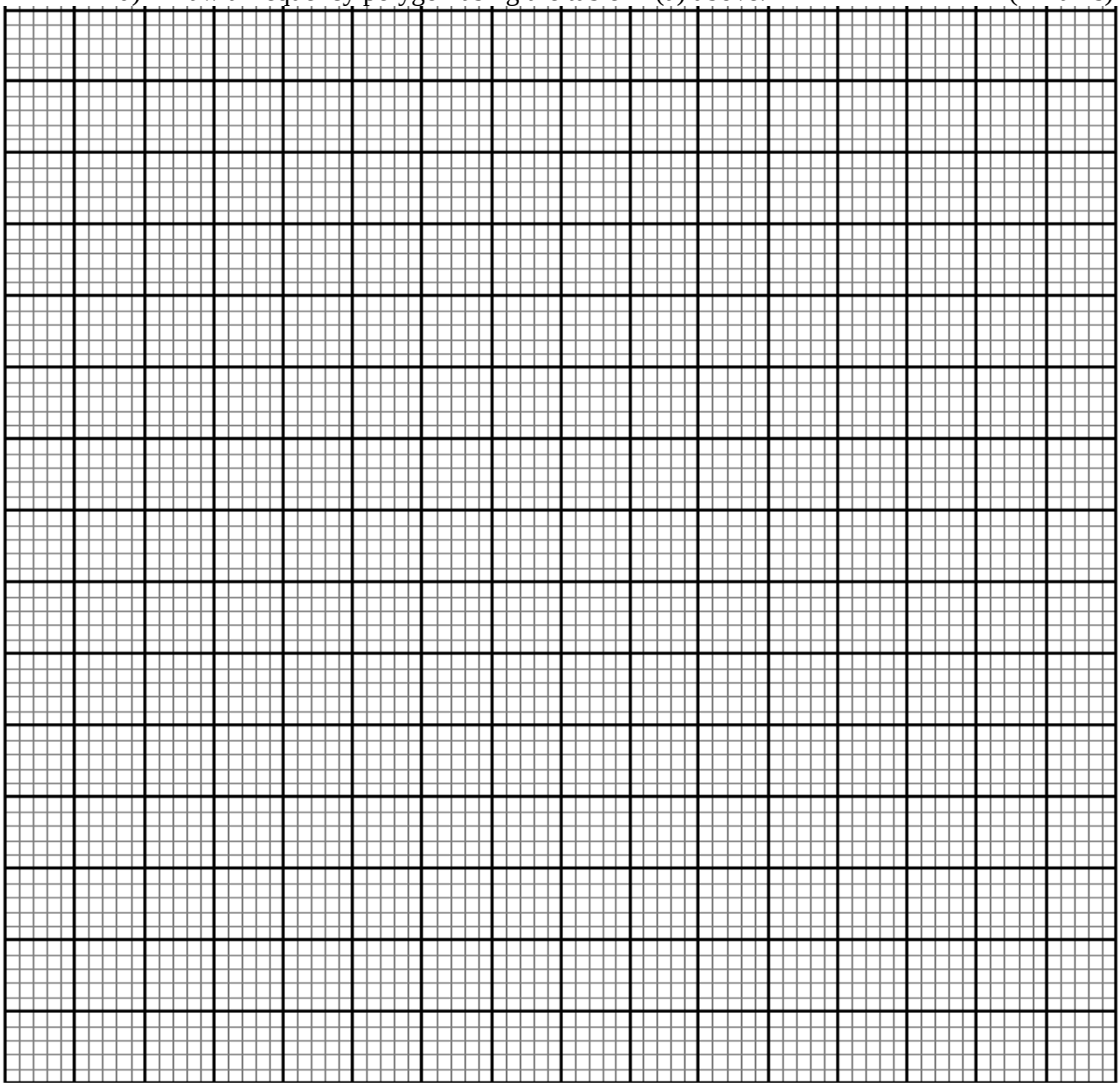
a) Make a frequency distribution table using a class interval of 5 and starting with the class 145 – 149. (2 marks)

b) From the table above

i) Calculate the mean mark (3 marks)

ii) Calculate the median (3 marks)

d) Draw a frequency polygon using the table in (a) above. (2 marks)



21. Kibirichia Boys Secondary School. Intends to buy a certain number of chairs For Ksh. 16,200. The supplier agreed to offer a discount of Ksh. 60 per chair Which will enable the school to get 3 chairs more.

Taking *y* as the originally intended number of chairs:-

a) Write an expression in terms of *y* for

i) Original price per chair. (1 mark)

ii) Price per chair after discount. (1mark)

b) Determine

i) The number of chair the school originally intended to buy. (4 marks)

ii) Price per chair after discount. (2 marks)

iii) The amount of money the school would have saved per chair of it got the intended number of chairs at a discount of 15%. (2 marks)

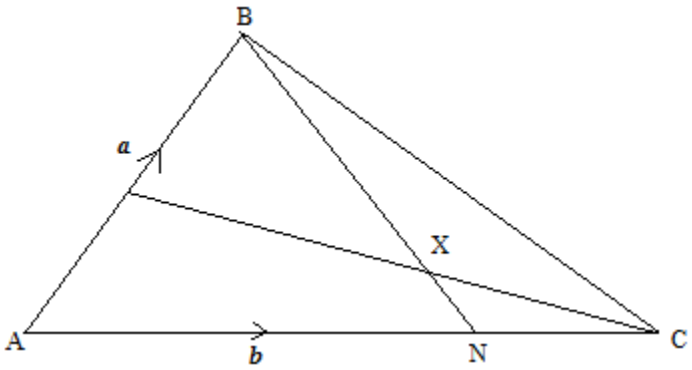
22. a) Without using a protractor, construct triangle ABC such that angle ABC = 60^0, BC = 8cm and AC = 9cm. Measure AB. (3 marks)

b) Draw a perpendicular from A to BC and measure its length. (2 marks)

c) Hence calculate the area of triangle ABC. (2 marks)

d) Locate a point D on BC such that the area of triangle ABC is three times that of triangle ABD. (3 marks)

23. In triangle ABC, shown below, AB = a AC = b point M lies on AB such that AM: MB = 2:3 and point N lies on AC such that AN: NC = 5:1 line BN intersects line MC at X.



a) Express the following in terms of ***a*** and ***b***

i) **BN** (1 mark)

ii) **CM** (1 mark)

b) Given that **BX** = k**BN** and **CX** = r**CM** where k and r are scalars

i) Write two different expressions for **AX** in term of a, b, k and r (4 marks)

ii) Find the values of k and r (4 marks)

24. A particle moves such that t seconds after passing a given point O is given by
$S = t(t-2)(t-1)$

a) Find its velocity when t = 2 second (3 marks)

b) Find its minimum velocity. (3 marks)

c) Find the time when the particles is momentarily at rest. (3 marks)

d) Find its acceleration when t = 3 seconds. (1mark)

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