SECTION A (20 marks)

*Answer **all** the questions in this section on the answer sheet provided.*

1. A packet contains number cards. Sally picked cards with numbers 2, 4, 5 and 9 from the packet. Which of the following sets has prime numbers **only**?

A. 2 and 4
B. 2 and 5
C. 4 and 9
D. 5 and 9

2. There are 120 boys, 180 girls and 24 teachers in a school. The school formed groups with equal numbers of boys, girls and teachers. What is the largest number of groups formed?

A. 12
B. 60
C. 324
D. 360

3. The temperature of a deep freezer was –8°C. The deep freezer was adjusted and the temperature was increased by 15°C. What was the temperature of the deep freezer after it was adjusted?

A. –23°C
B. –7°C
C. 7°C
D. 23°C

4. Kamau intended to plant 70 seedlings. He allocated $\frac{1}{5}$ of an hour to plant each seedling. During the planting, he took $\frac{1}{4}$ of an hour to plant each seedling. Which of the following calculations will give the extra time Kamau used to plant all the seedlings?

A. $\left(\frac{1}{5}+\frac{1}{4}\right)\times 70$
B. $\left(\frac{1}{4}\div\frac{1}{5}\right)\times 70$
C. $\left(\frac{1}{5}-\frac{1}{4}\right)\times 70$
D. $\left(\frac{1}{4}-\frac{1}{5}\right)\times 70$

Working Space

Working Space

5. A Grade 9 teacher had flash cards containing questions on indices. Kirui picked a flash card containing the question $2^x \times 2^3 = 32$. What is the value of x in the equation?

A. 16
B. 8
C. 2
D. $1\frac{2}{3}$

6. The total number of animals in Kiyapi's farm is 26. There are x donkeys in the farm. The number of goats in the farm is twice the number of donkeys. The remaining animals are sheep. Which of the following represents the number of sheep in the farm?

A. $26 - 3x$
B. $26 - 2x$
C. $26 - x$
D. $26 + 3x$

7. A school is planning to transport x number of learners for drama festivals. For cost efficiency, the school has to transport at least 30 learners but less than 50 learners. Which of the following inequalities represents the above information?

A. $30 < x < 50$

B. $30 < x \leq 50$

C. $30 \leq x \leq 50$

D. $30 \leq x < 50$

Working Space

8. Learners presented the results of two teams in a football league using the matrix:

$$\begin{pmatrix} 3 & 2 & 1 & 0 & 7 \\ 4 & 1 & 2 & 1 & 5 \end{pmatrix}$$

What is the order of the matrix?

A. 10×1

B. 1×10

C. 5×2

D. 2×5

9. The width of a door is 0.91 m. The door is opened through an angle of 72°. What is the length which the tip of the door sweeps through?

A. 5.72 m
B. 1.14 m
C. 0.57 m
D. 0.52 m

10. A water bucket is cylindrical in shape. The diameter of the bucket is 40 cm. The bucket is filled with water up to a height of 42 cm. What is the surface area of the bucket in contact with water?
(Use calculator value for π)

A. 1256.64
B. 5277.87
C. 6534.51
D. 7791.15

11. A packet of milk is in the shape of a cuboid. The length of the packet is 8.5 cm, the width is 5 cm and the height is 12 cm. What is the capacity of the packet in litres?

A. 0.51 litres
B. 5.1 litres
C. 510 litres
D. 510000 litres

Working Space

12. The temperature of a liquid was recorded as –15 K. Which of the following calculations gives the correct temperature in degrees celsius?

A. -15×273

B. $-15 \div 273$

C. $-15 + 273$

D. $-15 - 273$

13. The following table shows the mobile money transaction charges for a mobile service provider.

Transaction range (Ksh)	Sending charges (Ksh)	Withdrawal charges (Ksh)
1 - 150	Free	Free
151 - 300	10	10
301 - 500	15	23
501 - 1 000	25	28
1 001 - 2 500	30	35
Above 2 500	40	55

Loima had Ksh 4 000 in his mobile money account. He sent Ksh 1 500 to his sister and then withdrew Ksh 800. How much money did Loima remain with in his mobile account?

A. 1 642

B. 1 670

C. 1 672

D. 1 700

14. Salome estimated the height of a window to be 1.5 m. She measured it and found that the actual height was 1.2 m. Which of the following calculations gives the percentage error in her estimation?

A. $\frac{0.3}{1.5} \times 100\%$

B. $\frac{0.3}{1.2} \times 100\%$

C. $\frac{1.2}{1.5} \times 100\%$

D. $\frac{1.5}{1.2} \times 100\%$

Working Space

15. The following are properties of a quadrilateral.
(i) Opposite sides are equal and parallel
(ii) Diagonal bisect at 90°
(iii) Opposite angles are equal

What is the name of the quadrilateral?
A. Trapezium
B. Parallelogram
C. Rectangle
D. Rhombus

16. The scale on an architectural drawing was 1:100. A wall constructed using the drawing was 3 m long. What was the length of the wall on the drawing ?

A. 0.3 cm
B. 3 cm
C. 30 cm
D. 300 cm

17. Owino drew a straight line L_1. The equation of line L_1 is $2y = x + 3$. A line L_2 is perpendicular to L_1. What is the gradient of L_2?

A. $-\frac{1}{2}$
B. $\frac{1}{2}$
C. -2
D. 2

18. A photograph was enlarged to twice its original size. The original photograph had a length of 16 cm. What was the new length of the photograph?

A. 32 cm
B. 18 cm
C. 14 cm
D. 8 cm

19. The following figure shows an object in the shape of a triangle ABC.

Use a protractor to determine the size of angle ABC.

A. 60°
B. 85°
C. 95°
D. 105°

20. The letters of the word **ELEMENTAITA** were written on cards. Each letter was on its own card. The cards were placed in a bucket. Asha picked a card from the bucket at random. What is the probability that Asha picked a card with letter **E**?

A. $\frac{1}{11}$

B. $\frac{2}{11}$

C. $\frac{3}{11}$

D. $\frac{8}{11}$

SECTION B (80 marks)

*Answer **all** the questions in the spaces provided.*

21. Anita, a Grade 7 learner participated in a 10000 m race. She ran 6784 m and walked the remaining distance.

(a) Work out the distance that Anita walked. (1 mark)

(b) Write the distance that Anita ran in words. (1 mark)

(c) Write the distance that Anita ran rounded off to the nearest hundreds. (1 mark)

22. A metallic container is in the shape of a cube. The length of the container is 2.4 m.

(a) Determine the volume of the container. (2 marks)

(b) Smaller cubes of side 50 cm were packed in the container. Determine the number of smaller cubes that were packed. (2 marks)

23. A thanksgiving ceremony was attended by men, women and children. The ratio of men to women to children was 5:7:3. There were 60 children in the ceremony. Determine:

(a) the number of men who attended the ceremony; (3 m

(b) how many more women than men attended the ceremony. (2 m

24. A factory employed 5 men working 6 hours per day to pack flour in packets. The men work for 12 days. Determine how many more days 3 men working for 8 hours per day will take to pack the same amount of flour. (4 m

25. The number of malaria patients admitted in a hospital was expressed as a fraction of the total number of patients admitted. The fraction was written in decimal form as 0.17. Express the decimal in fraction form. (4 m

26. Regina bought 4 books and 3 pens from a shop and paid Ksh 315. Hamisi bought 8 books and 2 pens of the same type from the same shop. He paid Ksh 530. Determine the cost of one book and one pen.

(4 marks)

27. Two families, A and B bought oranges, mangoes and bananas in two weeks as shown in the following tables.

Week 1

Family	Oranges	Mangoes	Bananas
A	7	15	5
B	9	20	3

Week 2

Family	Oranges	Mangoes	Bananas
A	6	10	4
B	14	15	8

(a) Form matrices to represent the information provided.

(1 mark)

(b) Determine the total number of fruits of each type bought by each family.

(1 mark)

28. Mary drew a parallelogram on a grid. One side of the parallelogram passed through point (1,4) with a gradient of $\frac{1}{2}$. Determine:

(a) the equation of the line; (2 marks)

(b) the co-ordinates of the x-intercept of the line. (2 marks)

29. A Grade 8 learner moulded a solid in the shape of a cone. The slant height of the cone was 20 cm. The base radius of the cone was 4.2 cm. Calculate the total surface area of the solid, correct to 2 decimal places. (5 marks)

30. A cylindrical tin of radius 1.8 cm contains some water. A spherical ball bearing of radius 1.5 cm is immersed in water in the tin. Determine the rise in the water level in the tin, correct to one decimal place. (4 marks)

31. Juma placed a metal rod against a wall. The foot of the rod was 3.6 m away from the wall. The top of the rod was 4.8 m above the ground.

(a) Calculate the length of the rod. (2 marks)

(b) If the rod has a volume of 600 cm^3 and a mass of 2.4 kg, calculate the density of the rod. (2 marks)

32. A town P lies on the longitude 50°W. A town Q lies on the longitude 40°E. The local time at town Q is 4.00 p.m. Determine the local time at town P. (4 marks)

33. Festus imported a printing machine with a customs value of Ksh 1 200 000. He was charged an import duty at the rate of 20%, excise duty at the rate of 18% and Value Added Tax (VAT) at the rate of 16%. Determine the amount of money Festus paid as:

(a) import duty; (2 marks)

(b) excise duty; (2 marks)

(c) Value Added Tax. (1 mark)

34. A table top is in the shape of a parallelogram. The table top is represented by a drawing ABCD such that AB = 6 cm, AD = 4 cm and angle DAB = 45°. Using a ruler and a pair of compasses only, construct:

(a) parallelogram ABCD; (3 marks)

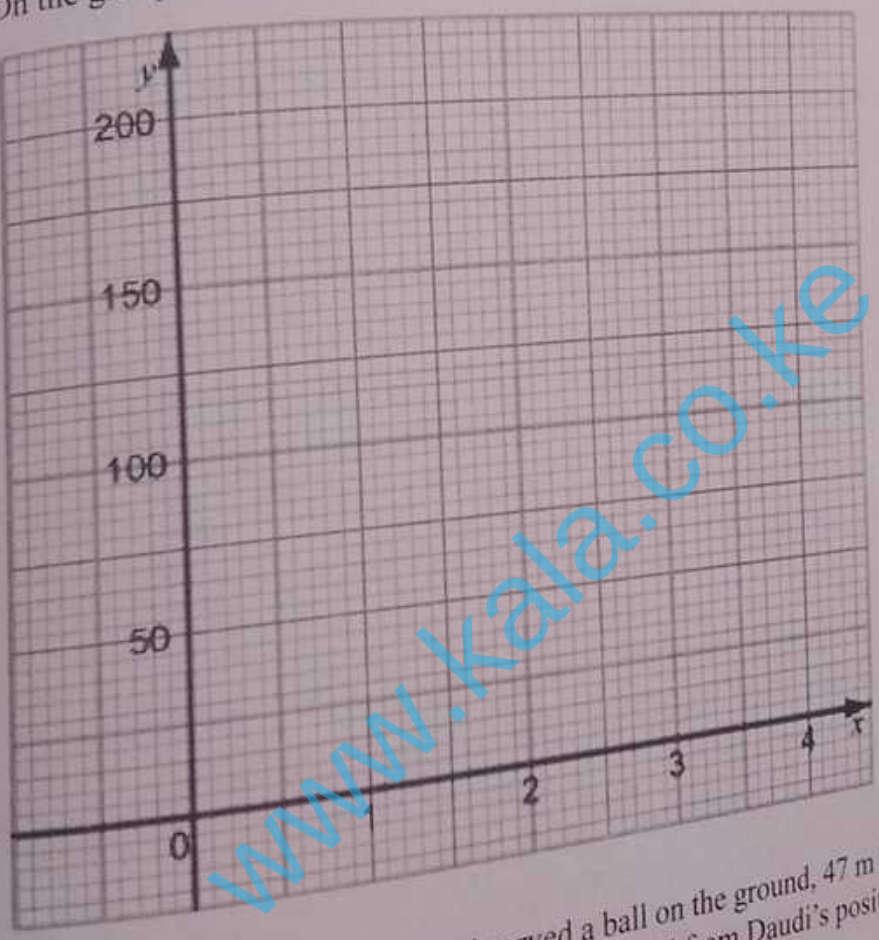
(b) perpendicular line from D to meet AB at E. Measure DE. (2 marks)

The amount of money (y) that a farmer gets from selling milk is given by the equation $y = 50x$ where x is the amount of milk in litres.

(a) Use the equation to complete the following table. (1 mark)

x	0	0.5	1	1.5	2
y	0		50	75	

(b) On the grid provided, draw the graph of $y = 50x$. (2 marks)



Daudi was standing on a balcony. He observed a ball on the ground, 47 m from the foot of the building. The angle of depression of the ball from Daudi's position was 35°. Calculate the height from the ground to where Daudi was. (2 marks)

37. A learner marked three points A, B and C on a playing field. From point A she walked 50 m on a bearing of 120° to reach point B. From point B she walked 70 m on a bearing of 210° to reach point B.

(a) Using a scale of 1 cm to represent 10 m, show the relative positions of points A, B and C. (3 marks)

(b) Use the diagram to determine:

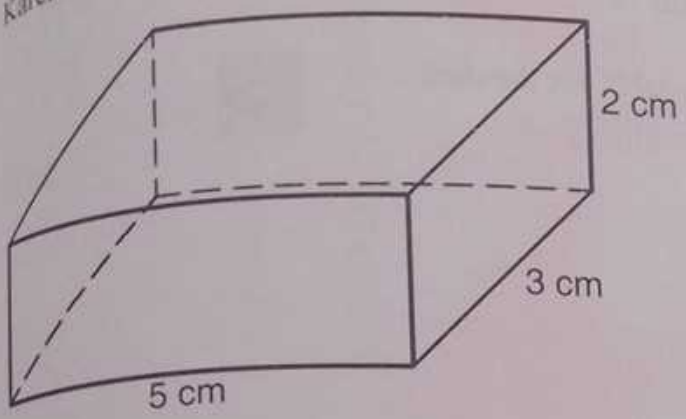
(i) the distance from A to C;

(1 mark)

(ii) the bearing of C from A.

(1 mark)

Karen modelled a cuboid of dimensions 3 cm by 5 cm by 2 cm as shown.



(a) Draw the net of the cuboid. (2 marks)

(b) Calculate the total surface area of the cuboid from the net. (3 marks)

39. The marks scored by 20 learners in a test were recorded as 19, 17, 19, 15, 17, 19, 22, 17, 17, 19, 18, 33, 17, 29, 18, 15, 19, 18, 22, and 19.

(a) Prepare a frequency distribution table for the data. (2 marks)

(b) Determine the:

(i) mean mark; (2 marks)

(ii) median mark. (1 mark)

40. Rebecca tossed a coin and a die at the same time.

(a) Write down the probability space to show the possible outcomes. (2 marks)

(b) Determine the probability that Rebecca obtained a head on the coin and a 4 on the die. (1 mark)

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