



GRADE 9 MATHEMATICS

SECTION A (20 MARKS)

Answer all questions

1. The government released Ksh 67,045,010 to elderly people in 2024. Which is the correct way of writing this amount in words?
A. Sixty-seven million, forty-five thousand and ten
B. Sixty-seven million and forty-five thousand and ten hundred
C. Six hundred and seventy million, four hundred and fifty thousand and ten
D. Sixty-seven million, four hundred and fifty thousand and ten
2. If $\sqrt{X} = 32$, what is the value of X ?
A. 32
B. 128
C. 1024
D. 32,768
3. Simplify: $a^6b^3 \div a^2b$
A. a^4b^2
B. a^8b^4
C. a^2b^4
D. a^3b^2
4. A submarine is 120 m below sea level. It rises 75 m then descends 50 m. What is its final position?
A. -95 m
B. -120 m
C. -145 m
D. +95 m
5. Solve: $2(x - 1) + 3(x + 2) = 19$
A. 2
B. 3
C. 4
D. 5

6. A rectangular field measures 240 m by 180 m. Find the approximate length of its diagonal.
A. 290 m
B. 295 m
C. 300 m
D. 305 m

WORKING SPACE

7. Solve the inequality: $3x - 4 \leq 2x + 5$

- A. $x \geq 9$
- B. $x \leq 9$
- C. $x \geq -9$
- D. $x \leq -9$

8. Two customers buy sugar and flour as follows:

- 2 kg sugar + 1 kg flour = Ksh 310
 - 1 kg sugar + 3 kg flour = Ksh 440
- Find the price of sugar per kg.

- A. 98
- B. 100
- C. 114
- D. 120

9. A straight line passes through (2,5) and has gradient 3. Its equation is:

- A. $y = 3x - 1$
- B. $y = 3x + 1$
- C. $y = 3x - 2$
- D. $y = 3x + 2$

10. A tap fills a tank in 6 hours while another empties it in 8 hours. If both are opened together, how long will it take to fill the tank?

- A. 12 h
- B. 24 h
- C. 48 h
- D. 26 h

11. A job is completed by 12 men in 15 days. How many men are required to complete it in 9 days?

- A. 15

B. 18

C. 20

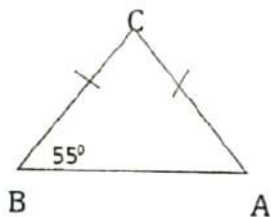
D. 25

12. A cylinder has a curved surface area of 4400 cm^2 and height 25 cm. Find its radius ($\pi = 22/7$).

- A. 25 cm
- B. 28 cm
- C. 30 cm
- D. 32 cm

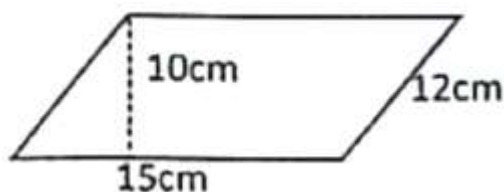
WORKING SPACE

13. A sector of a circle has area 154 cm^2 and radius 14 cm . Find the angle of the sector.
- A. 60° B. 90°
C. 120° D. 150°
14. Evaluate: $16 \div 4 \times 5(9 - 4) + 4 - 5$
A. 49 B. 57 C. 12 D. 18
15. In an isosceles triangle ABC, angle ABC = 55° and $AC = BC$.



Find angle BCA.

- A. 70° B. 125°
C. 62.5° D. 110°
16. Convert 36 km/h into m/s .
A. 10 m/s B. 18 m/s
C. 20 m/s D. 36 m/s
17. Find the area of the figure with dimensions 10 cm , 12 cm and 15 cm .



- A. 120 cm^2 B. 150 cm^2
C. 180 cm^2 D. 1800 cm^2
18. Given matrices A and B,

find $A + B$

if: $A = \begin{bmatrix} 7 & 4 \\ 2 & 9 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 6 \\ 5 & 1 \end{bmatrix}$

A. $\begin{bmatrix} 10 & 10 \\ 7 & 10 \end{bmatrix}$

B. $\begin{bmatrix} 4 & 3 \\ 10 & 8 \end{bmatrix}$

C. $\begin{bmatrix} 21 & 10 \\ 24 & 9 \end{bmatrix}$

D. $\begin{bmatrix} 5 & 7 \\ 2 & 8 \end{bmatrix}$

19. Simplify:

$$\sqrt[3]{x^{12}y^{15}}$$

A. $x^{12}y^{15}$

B. x^4y^5

C. $x^{36}y^{45}$

D. $\sqrt[3]{xy}$

20. Peter has sh Y. John has six times Peter's money. Joseph has sh 10 less than John. What is the total amount they have?

A. $12Y - 10$

B. $6Y - 10$

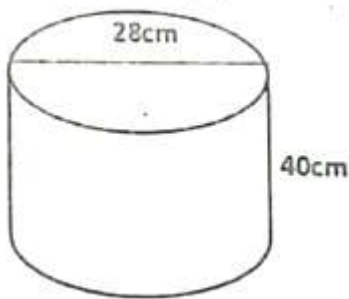
C. $6Y + 10$

D. $13Y - 10$

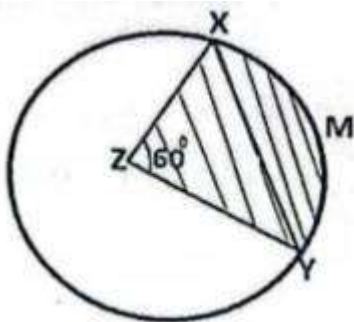
WORKING SPACE

SECTION B (80 MARKS)

21. A cylinder has a diameter of 28 cm and height 40 cm. Find its volume. ($\pi = 22/7$)



22. A circle has radius 42 cm and a central angle of 60° . Find the area of the sector.



23. A ship travels 120 km east and 160 km north. Find the shortest distance back to the starting point.

24. A square-based pyramid has base side 12 cm and slant height 15 cm.

a) Find base area

5

b) Find area of one triangular face

c) Find total surface area

25. Find the gradient and equation of the line passing through A(2,3) and B(6,11).

26. A bag contains 5 red, 3 green and 2 blue balls. Two balls are drawn without replacement. Find the probability that both are red.

27. The marks of 21 students are given.

6,8,7,5,9,6,4,7,8,10,9,5,6,7,5,4,6,8,9,7,7

a) Construct a frequency table

b) Find mode

c) Find median

28. Given matrices A , B and C , evaluate $A + B - C$.

$$A = \begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix}, C = \begin{bmatrix} 0 & 2 \\ 4 & 6 \end{bmatrix}$$

29.Round 58,047,000 to 4 significant figures.

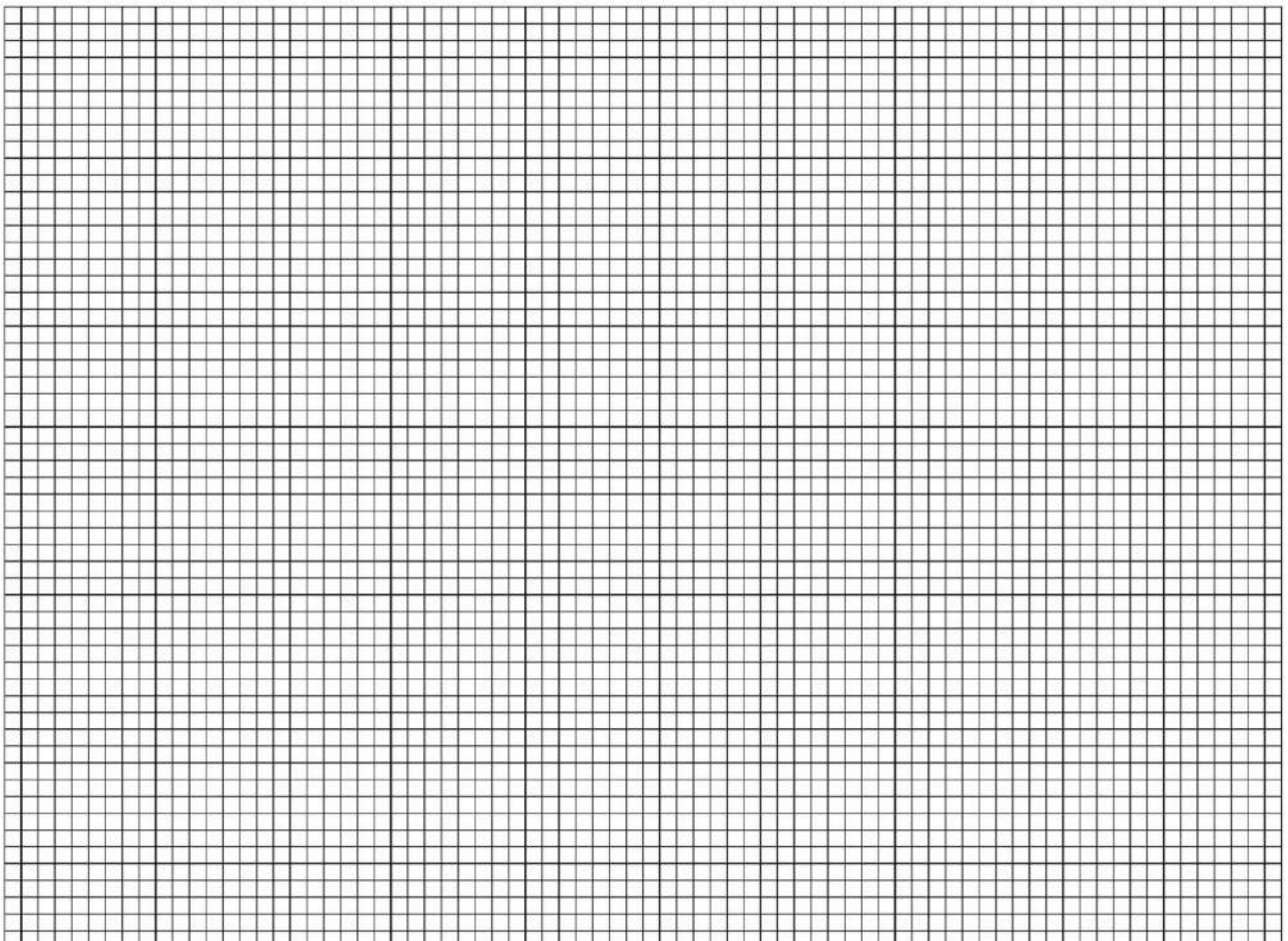
30.Evaluate $\log_{10} 1000$.

31. Solve the simultaneous equations:

$$x - y = 6$$

$$3x + 2y = 24$$

32.Represent the inequality $2x + y \leq 6$ on a graph and give one valid solution.



33. Construct triangle MNP where $MN = 6\text{ cm}$, $NP = 8\text{ cm}$, $MP = 10\text{ cm}$.

a) Construct circumcircle

b) State diameter

c) Measure angle MPN

34. A trip has 150 learners. Each bus carries 30 learners.

a) Find number of buses

b) Find total cost of buses if each costs Ksh 12,000

c) Find total meal cost at Ksh 80 per learner

35. A tank measures $2.5 \text{ m} \times 4 \text{ m} \times 6 \text{ m}$. Find its capacity in litres.

36. A salesman earns Ksh 15,000 plus 10% commission on Ksh 25,000 sales. Find total earnings.

37. A refrigerator costs Ksh 35,000. A 12% discount is given. Find discount amount.

38. Express 0.25 as a fraction and solve hire purchase question.

39. Seki and John share oranges in ratio 4:5. John has 3 more than Seki. Find number of oranges.

40. A solid of mass 250 g has volume 50 cm^3 . Find density in kg/m^3 .

ANSWERS

MATHEMATICS (903)

SECTION A

1. **D**
2. **C** $(1024) \rightarrow \sqrt{X}=32 \Rightarrow X=1024$
3. **B** (a^4b^2)
4. **A** (-95 m)
5. **B** (3)
6. **B** (295 m)
7. **C** $(x \leq 9)$
8. **C** (100)
9. **A** $(y = 3x - 1)$
10. **A** $(12 \text{ hours approx})$
11. **B** (20 men)
12. **B** (28 cm)
13. **A** (60°)
14. **B** (57)
15. **A**
16. **C** (10 m/s)
17. **D**
18. **A**
19. **B**
20. **A** $(12Y - 10)$

SECTION B (KEY ANSWERS)

21. Cylinder volume = **2464 cm^3**
22. Sector area $\approx$ **924 cm^2**
23. Distance = **200 km**
24. Pyramid:
 - Base area = **144 cm^2**

- One face = 90 cm^2

25. Gradient = **2**, equation: $y = 2x - 1$

26. $P(\text{both red}) = \frac{2}{15}$

27. Mode = **7**, median = **7**

28. $A + B - C =$

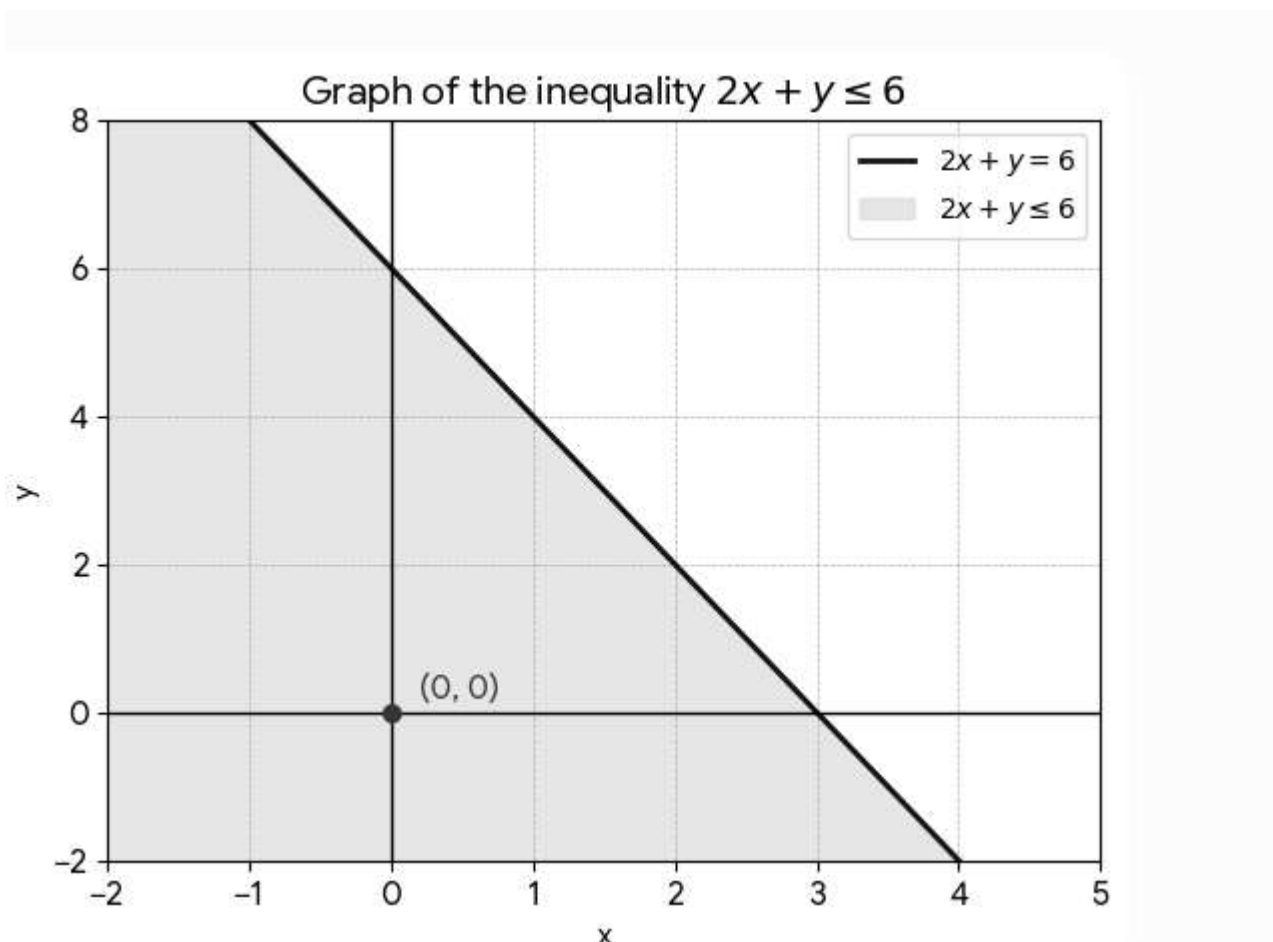
$$\begin{pmatrix} 3 & 7 \\ 11 & 15 \end{pmatrix}$$

29.4 s.f = **58,050,000**

30. $\log_{10} 1000 = 3$

31. $x=6$, $y=0$

32. Graph inequality



33. Triangle MNP:

- Diameter = 10 cm
- Angle = 90°

34. Buses = 5

Meals = 12,000 buses cost = 60,000

35. Tank capacity = **60,000 litres**

36.Commission = 2,500; Total = 17,500

37.Discount = 4,200

38.Fraction = $\frac{1}{4}$

39.Seki = 12 oranges

40.Density = 5000 kg/m^3