

MATHEMATICS

503



Nov. 2022 – 2 hours

INSTRUCTIONS TO CANDIDATES (Please read these instructions carefully)

1. You have been given this question booklet and a separate answer sheet. The question booklet contains 50 questions.
2. Do any necessary rough work in this booklet.
3. When you have chosen your answer, mark it on the **ANSWER SHEET**, not in this question booklet.

HOW TO USE THE ANSWER SHEET

4. Use an ordinary pencil.
5. Confirm that the answer sheet that you have been provided with has the following:

YOUR INDEX NUMBER
YOUR NAME
NAME OF YOUR SCHOOL

6. Do not make any marks outside the boxes.
7. Keep the sheet as clean as possible and do not fold it.
8. For each of the questions 1–50, four choices are given. The choices are lettered A, B, C and D. In each case only **ONE** of the four choices is correct. Choose the correct answer.
9. On the answer sheet, show the correct answer by drawing a **dark line** inside the box in which the letter you have chosen is written.

Example:

In the Question Booklet:

12. What is the value of $\frac{6(24 - 18) + 6 \times 4}{6}$?
- A. 30
 - B. 25
 - C. 10
 - D. 28

The correct answer is C

On the answer sheet:

In the set of boxes numbered 12, draw a **dark line** inside the box with the letter C printed in it as indicated below.

12 [A] [B] [C] [D]

10. Your **dark line** **MUST** be inside the box.
11. For each question **ONLY ONE** box is to be marked in each set of four boxes.

This Question Paper consists of 14 printed pages.



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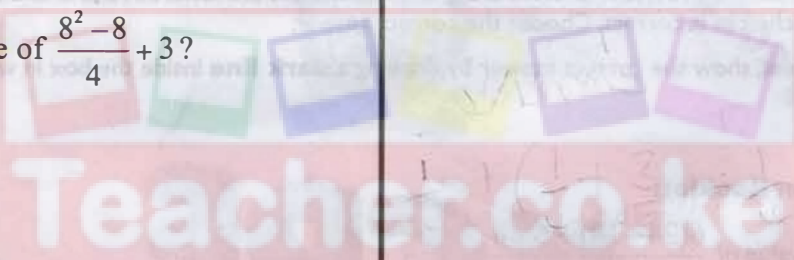
1. What is 400300085 written in words?
 - A. Four hundred million three hundred and eighty five
 - B. Four hundred million three thousand and eighty five
 - C. Four hundred million thirty thousand and eighty five
 - D. Four hundred million three hundred thousand and eighty five

2. What is the total value of digit 6 in 5960124?
 - A. 600
 - B. 6000
 - C. 60000
 - D. 600000

3. Which one of the following statements is correct?
 - A. $0.95 < 0.095$
 - B. $0.075 > 0.75$
 - C. $3.85 < 3.75$
 - D. $1.25 > 0.125$

4. What is the value of $\frac{8^2 - 8}{4} + 3$?
 - A. 5
 - B. 14
 - C. 17
 - D. 65

5. A tailor had $24\frac{3}{4}$ metres of a clothing material. The tailor sold $\frac{1}{3}$ of the material and used $1\frac{1}{4}$ metres to make a shirt. How many metres of the clothing material remained?
 - A. $16\frac{1}{2}$
 - B. $15\frac{1}{4}$
 - C. $9\frac{1}{2}$
 - D. 7



6. Work out $\frac{1}{3}$ of $(\frac{1}{4} + \frac{3}{5}) \div \frac{1}{4}$.

- A. $\frac{16}{27}$
- B. $\frac{17}{240}$
- C. $1\frac{2}{15}$
- D. $2\frac{29}{60}$

7. What is the next number in the pattern 45, 51, 57, 59, 65, 71, ____?

- A. 73
- B. 75
- C. 77
- D. 79

8. Karanja, Wanjala and Amina weighed themselves. Karanja weighed 46.8 kg. Wanjala was 0.5 kg heavier than Karanja while Amina was 1.3 kg lighter than Wanjala. What was their total mass altogether?

- A. 142.7 kg
- B. 140.1 kg
- C. 139.6 kg
- D. 138.1 kg

9. What is the value of $\frac{4.8 \times 18.3}{6 \times 0.6}$

- A. 244
- B. 24.4
- C. 2.44
- D. 0.244

10. What is 962.997 rounded off to 1 decimal place?

- A. 962.0
- B. 962.9
- C. 963.0
- D. 963

Working Space



13. The table shows the number of people who attended a sports fair in a certain year.
- | Category | Number of people |
|---------------|------------------|
| Male adults | 104 |
| Female adults | 104 |
| Children | 208 |
14. What is the value of $(\frac{5}{6} - \frac{1}{3}) \div \frac{1}{2}$?

15. How many more boys than girls are there in the school? (The number of boys is 100 and the number of girls is 80.)

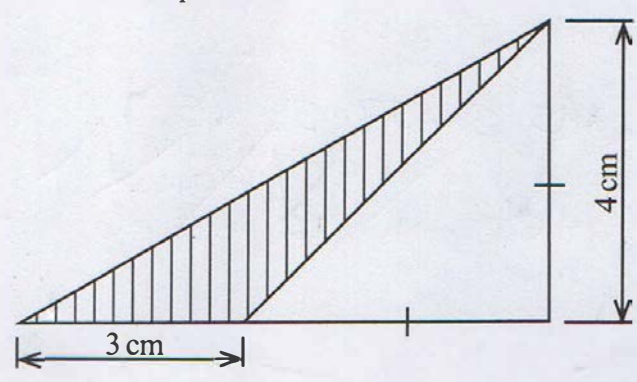
16. A car travels 100 km in 2 hours. How long will it take to travel 200 km at the same speed?

17. A shopkeeper has 100 kg of rice. He sold 25 kg on Monday, 30 kg on Tuesday, and 40 kg on Wednesday. How much rice is left?

18. A car travels 100 km in 2 hours. How long will it take to travel 200 km at the same speed?

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11. In the figure shown, what is the area of the shaded part?



- A. 6 cm²
- B. 8 cm²
- C. 14 cm²
- D. 20 cm²

12. The table shows the number of people who attended a trade fair in a certain year.

Male adults	Female adults	Children
793	1064	3059

Each adult paid sh 200 and each child paid sh 150. How much more money was paid by the children than adults?

- A. sh 87 450
- B. sh 371 400
- C. sh 458 850
- D. sh 830 250

13. What is the value of $\sqrt{2\frac{14}{25} - \left(\frac{2}{5}\right)^2}$?

- A. $\frac{4}{5}$
- B. $1\frac{3}{5}$
- C. $1\frac{11}{25}$
- D. $2\frac{2}{5}$

14. Rose used 99 poles to fence round a circular garden. The distance between one pole to the next pole was 2 metres. What was the diameter of the garden?

- (Take $\pi = \frac{22}{7}$)
- A. 198 metres
 - B. 126 metres
 - C. 63 metres
 - D. 31.5 metres

Working Space

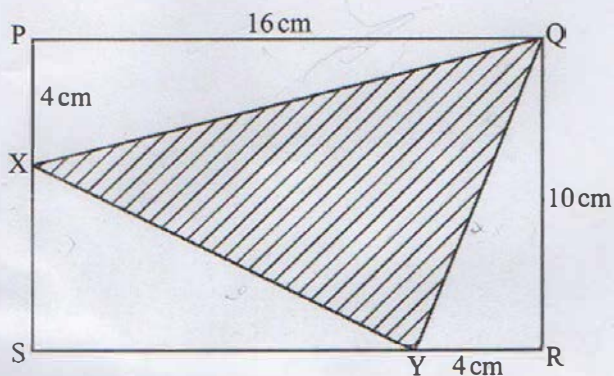
Handwritten student work for questions 7, 8, and 10. Question 7 asks for the next number in a pattern: 48, 21, 57, 58, 11. The student has written '12'. Question 8 is a word problem about weights: 'Wanjala was 0.3 kg heavier than Kanja while Anna was 1.3 kg lighter than Wanjala. What was their total mass?' The student has written '142.7 kg'. Question 10 asks for the value of $2\frac{14}{25}$ rounded off to 1 decimal place. The student has written '2.6'.



15. A right angled triangle has an area of 96m^2 . The base of the triangle is 12 m. What is the length of the longest side?

- A. 16 m
- B. 20 m
- C. 28 m
- D. 400 m

16. The figure PQRS is a rectangle in which line $PQ = 16\text{cm}$ and line $QR = 10\text{cm}$. X and Y are points on the rectangle. The line $PX = \text{line } YR = 4\text{cm}$.



What is the area of the shaded part?

- A. 88cm^2
- B. 72cm^2
- C. 36cm^2
- D. 32cm^2

17. The area of one end of a cylindrical pipe is 8cm^2 . The pipe holds 4m^3 of water. What is the length in metres, of the pipe?

- A. 500000
- B. 50000
- C. 5000
- D. 500

18. A tank had 2125 litres of water. The water was poured into a container which has a square base of side 250 cm. What was the height of the water in the container?

- A. 34 cm
- B. 340 cm
- C. 3400 cm
- D. 34000 cm

420

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19. A school has enough food to feed 800 learners for 20 days. If 200 more learners were admitted to the school, how many days would the same food be able to feed all the learners?

- A. 25
- B. 16
- C. 5
- D. 4

20. A lorry weighs 7200 kg when empty. It weighed 12.6 tonnes when loaded with some 90 kg bags of maize. How many bags of maize were loaded on the lorry?

- A. 140
- B. 80
- C. 60
- D. 20

21. In the triangle shown, construct a perpendicular line from point P to meet line RQ at point W.



Measure the line RW. What is the length of line RW?

- A. 7.8 cm
- B. 4.5 cm
- C. 3.9 cm
- D. 3.0 cm

22. The three angles of a triangle are x° , $(x - 4)^\circ$ and $(3x - 1)^\circ$. What is the size of the smallest angle in the triangle?

- A. 31°
- B. 33°
- C. 37°
- D. 110°

Working Space

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16. The figure PQRS is a rectangle in which line PQ = 16 cm and line QR = 10 cm. X and Y are points on the rectangle. The line PX = line YR = 4 cm.

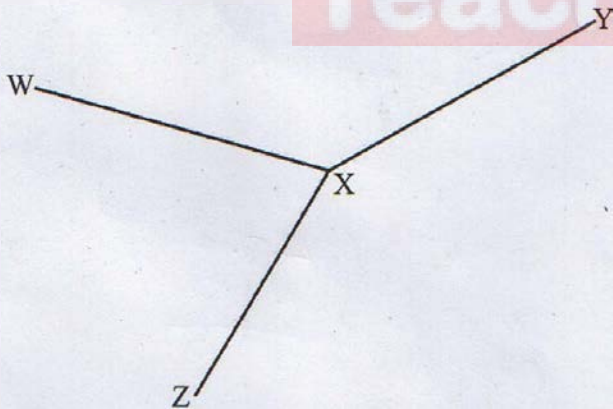
17. The area of an equilateral triangle is 1732 cm^2 . What is the length in metres of the side?

18. A well has 2152 litres of water. The water was poured into a container which has a square base of side 28 cm. What was the height of the water in the container?

Working Space

23. Which one of the following is true for both an equilateral triangle and a rectangle?
- All sides are equal.
 - All angles are equal.
 - All angles add up to 180° .
 - All angles add up to 360° .
24. John walked a distance of 9 km from home to the market. He then walked back home. The whole journey took a total of 3 hours. What was the average speed for the whole journey?
- 54 km/h
 - 18 km/h
 - 6 km/h
 - 3 km/h
25. Two sisters shared sh3 600 in the ratio 3:5. What was the difference in the amount of money received by the sisters?
- sh2 250
 - sh 2 160
 - sh 1350
 - sh 900

26. The following lines have been constructed to meet at point X.



What is the measure of angle WXZ?

- 75°
- 105°
- 135°
- 150°

27. A salesperson is paid a monthly salary of sh 9 000. She is also paid a commission of 10% for all the goods sold above sh 10 000. In a certain month, her total earnings were sh 10 500. What was the total sales of goods in that month?
- A. sh 15 000
 B. sh 24 000
 C. sh 25 000
 D. sh 35 500
28. A tourist travelled from Mombasa to Nairobi by bus. The bus left Mombasa at 1.45 p.m and took $9\frac{1}{2}$ hours to arrive in Nairobi. What time in 24 hour clock system, did the bus arrive in Nairobi?
- A. 0415 h
 B. 1115 h
 C. 2215 h
 D. 2315 h
29. A cylindrical tin has a diameter of 14 cm and a height of 30 cm. The curved surface of the tin is completely covered by a label. What is the area of the tin covered by the label?
- (Take $\pi = \frac{22}{7}$)
- A. 660 cm^2
 B. 1320 cm^2
 C. 1628 cm^2
 D. 4620 cm^2
30. The average mass of 40 pupils in a class was 41.8 kg. When the mass of the teacher was added, the average mass became 42.7 kg. What was the mass of the teacher?
- A. 42.25 kg
 B. 78.7 kg
 C. 82.7 kg
 D. 88.7 kg

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24. John walked a distance of 9 km from home to the market. He then walked back home. The whole journey took a total of 3 hours. What was the average speed for the whole journey?

A. 3 km/h
 B. 3 km/h
 C. 3 km/h
 D. 3 km/h

25. Two sisters shared sh 7 000 in the ratio 3:2. What was the difference in the amount of money received by the sisters?

A. sh 250
 B. sh 100
 C. sh 120
 D. sh 900

26. The following lines have been constructed to meet at point O.

What is the measure of angle WXS?

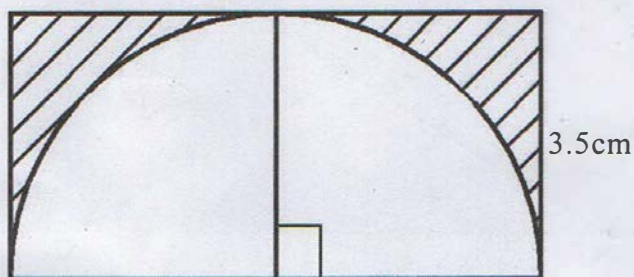
A. 75°
 B. 105°
 C. 135°
 D. 150°

31. A cylindrical tank of radius 5 m and a height of 3.5 m is full of water. On a certain day, the level of water dropped by 14 cm after being used for irrigation. How many litres of water were used on that day?

(Take $\pi = \frac{22}{7}$)

- A. 11000
- B. 110000
- C. 1100000
- D. 11000000

32. The figure shows a semicircle of radius 3.5 cm enclosed in a rectangle.



What is the area of the shaded part?

(Take $\pi = \frac{22}{7}$)

- A. 43.70 cm²
- B. 24.50 cm²
- C. 19.25 cm²
- D. 5.25 cm²

33. Mercy has 5 bags of maize and Peter has 3 bags of maize. The mass of 1 bag of maize is represented by $(x + 10)kg$. Which one of the following expressions will show the total mass of maize that they have?

- A. $(8x + 80)kg$
- B. $(8x + 10)kg$
- C. $(5x + 50)kg$
- D. $(3x + 30)kg$

34. What is $\frac{1}{4}(32g + 16f) + \frac{1}{3}(15g + 9f)$ in the simplest form?

- A. $13g + f$
- B. $13g + 7f$
- C. $47g + f$
- D. $47g + 7f$

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35. What is the value of $\frac{x^2 + y^2}{x - y}$, given that $x = 8$ and $y = 6$?
- A. 7
B. 14
C. 50
D. 98
36. Using a ruler and a pair of compasses only, construct an equilateral triangle XYZ of side 7 cm. Construct a circle passing through points X, Y and Z. What is the measure of the diameter of the circle?
- A. 2 cm
B. 4 cm
C. 6 cm
D. 8 cm
37. The following are properties of a certain quadrilateral:
- (i) Diagonals are equal.
 - (ii) Diagonals bisect each other at 90° .
 - (iii) Has two pairs of parallel lines.
 - (iv) Interior angles are equal.
- What is the name of the quadrilateral described by the properties?
- A. Square
B. Rectangle
C. Rhombus
D. Parallelogram
38. Mark bought a piece of land for sh 1 500 000. After some years, he subdivided the land into 8 equal plots. He sold each plot at sh 350 000. What was the percentage profit made from the sale of all the plots?
- A. $10\frac{5}{6}\%$
B. $23\frac{1}{3}\%$
C. $46\frac{3}{7}\%$
D. $86\frac{2}{3}\%$

31. A cylindrical tank is 2 m high and a nozzle at the top is full of water. On a certain day, the level of water dropped by 14 cm after being used for irrigation. How many litres of water were used on that day?

(Take $\pi = \frac{22}{7}$)

A. 11000
B. 110000
C. 1100000
D. 11000000

32. The figure shows a semicircle of radius 3.5 cm enclosed in a rectangle.



What is the area of the shaded part?

(Take $\pi = \frac{22}{7}$)

A. 43.70 cm²
B. 24.40 cm²
C. 19.25 cm²
D. 2.25 cm²

33. Mercy has 2 bags of maize. The mass of 1 bag of maize is represented by $4x + 10kg$. Which one of the following expressions will show the total mass of maize that they have?

A. $18x + 80kg$
B. $8x + 10kg$
C. $8x + 20kg$
D. $8x + 30kg$

34. What is the simplest form of $\frac{1}{2}(32g + 16g) + \frac{1}{3}(12g + 9g)$ in the simplest form?

A. $12g + 1$
B. $12g + 11$
C. $41g + 1$
D. $41g + 11$

39. The table shows bus fare for adult passengers in shillings between different towns.

Town K				
300	Town L			
500	300	Town M		
600	300	200	Town N	
700	400	300	200	Town P

Amina and her two children travelled by bus from town K to P via N. The bus fare for children was half that of adults. How much money did Amina and her children spend as fare for the whole journey altogether?

- A. sh 1 400
 - B. sh 1 600
 - C. sh 2 000
 - D. sh 2 400
40. Nicholas paid sh 4000 for a carpet after getting a discount of 20%. What would have been the percentage discount had he bought the carpet for sh 3 800?
- A. 4%
 - B. 24%
 - C. 30%
 - D. 76%
41. Patel bought the following items from a shop:
- (i) $3\frac{1}{2}$ kg of maize flour @ sh 90 per kg
 - (ii) 2 loaves of bread for sh 110
 - (iii) 5 packets of milk @ sh 52
 - (iv) 4 kg of rice @ sh 69 per kg

He paid for all the items using a sh 1 000 note. How much more money should Patel give the shopkeeper so as to be given a balance of a sh 100 note?

- A. sh 961
- B. sh 161
- C. sh 61
- D. sh 39

Working Space

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A road map showing 1:50000 is represented on a map by a line measuring 7.5cm. What is the scale of the map?

- A. 1:20
- B. 1:200
- C. 1:5000
- D. 1:50000

The table shows postal charges for sending parcels.

Mass (kg)	Charges (sh)
Up to 2kg	25
Over 2kg up to 10kg	100
Over 10kg up to 15kg	150
Over 15kg up to 20kg	200
For each additional 1kg of parcel (above 20kg)	50

A wholesaler sent three parcels weighing 1kg, 11kg and 27kg. How much money was the wholesaler charged for sending the parcels altogether?

- A. sh 900
- B. sh 112
- C. sh 128
- D. sh 133

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42. The marked price of a radio was sh 3 200. The hire purchase price was 115% of the marked price. Mutai bought the radio on hire purchase terms. He paid a deposit of sh 1 680 and 4 equal monthly instalments. How much money was each monthly instalment?
- A. sh 500
 - B. sh 920
 - C. sh 2 000
 - D. sh 3 680

43. A road measuring 1.5 km is represented on a map by a line measuring 7.5 cm. What is the scale of the map?
- A. 1:20
 - B. 1:200
 - C. 1:2000
 - D. 1:20000

44. The table shows postal charges for sending parcels.

Mass (kg)	Charges (sh)
Up to 5 kg	235
Over 5 kg up to 10 kg	290
Over 10 kg up to 15 kg	375
Over 15 kg up to 30 kg	525
For each additional 1 kg or part thereof up to 50 kg	19

A wholesaler sent three parcels weighing; 2 kg, 11 kg and 37 kg. How much money was the wholesaler charged for sending the parcels altogether?

- A. sh 905
- B. sh 1 135
- C. sh 1 268
- D. sh 1 313

Working Space

Town K				
Town J	300			
Town M	300	300		
Town N		300	300	
Town P			300	300

Amnia and her two children travelled by bus from town K to P via N. The bus fare for children was half that of adults. How much money did Amnia and her children spend as fare for the whole journey altogether?

- A. sh 1 800
- B. sh 1 500
- C. sh 3 000
- D. sh 2 400

48. A shopkeeper paid sh 4 000 for a carpet after getting a discount of 20%. What would have been the original price of the carpet if he bought the carpet for sh 3 800?

- A. sh 4 800
- B. sh 4 500
- C. sh 3 000
- D. sh 3 800

41. Paul bought the following items from a shop:

- (i) 3 kg of maize flour @ sh 90 per kg
 - (ii) 2 loaves of bread for sh 110
 - (iii) 2 packets of milk @ sh 22
 - (iv) 4 kg of rice @ sh 60 per kg
- He paid for all the items using a sh 1 000 note. How much more money should Paul give the shopkeeper so as to be given a balance of a sh 100 note?

- A. sh 98
- B. sh 101
- C. sh 81
- D. sh 38

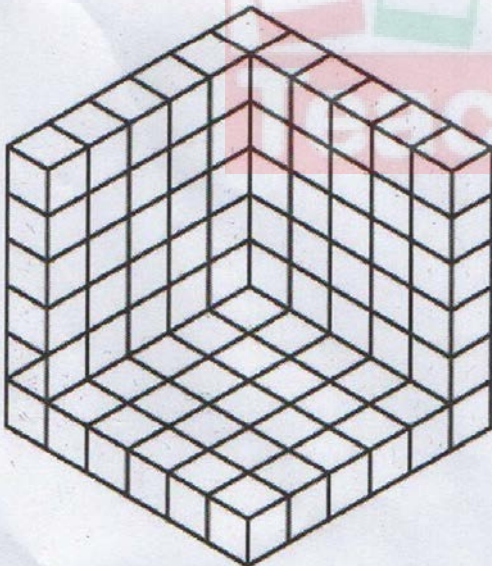
45. The sitting capacity of a matatu was decreased from 14 passengers to 11 passengers. What was the percentage decrease in the sitting capacity?

- A. $21\frac{3}{7}\%$
- B. $27\frac{3}{11}\%$
- C. $72\frac{8}{11}\%$
- D. $78\frac{4}{7}\%$

46. Oleluko earns a salary of sh 14400 every month. He spends sh 7200 on food, sh 4000 on house rent, sh 2160 on airtime and saves the rest. A pie chart was drawn to show how Oleluko spent his salary. What was the size of the angle that represented the savings?

- A. 26°
- B. 54°
- C. 100°
- D. 180°

47. The figure shows an incomplete stack of cubes.



How many cubes are in the stack?

- A. 216
- B. 125
- C. 108
- D. 91

Working Space

48. A bank has a simple interest rate of 12% per annum. How much money did she have in the bank at the end of nine months?

- A. sh 432
- B. sh 276
- C. sh 232
- D. sh 376

49. What is the value of x in $7(x + 2) = 4x + 4$?

- A. 20
- B. 8
- C. 4
- D. 3

50. Which one of the following nets will form a triangular prism?



48. Atieno deposited sh4 800 in a bank. The bank paid simple interest at the rate of 12% per annum. How much money did she have in the bank at the end of nine months?

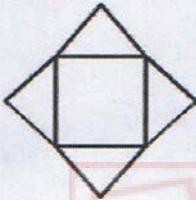
- A. sh 432
- B. sh 576
- C. sh 5232
- D. sh 5376

49. What is the value of x in $3(x + 8) = 4(x + 4)$?

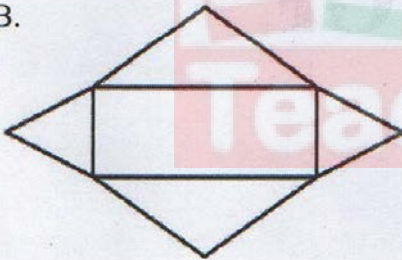
- A. 20
- B. 8
- C. 4
- D. 3

50. Which one of the following nets will form a triangular prism?

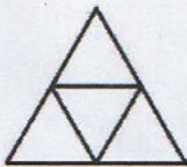
A.



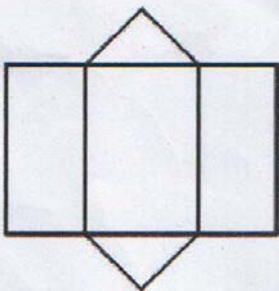
B.



C.



D.



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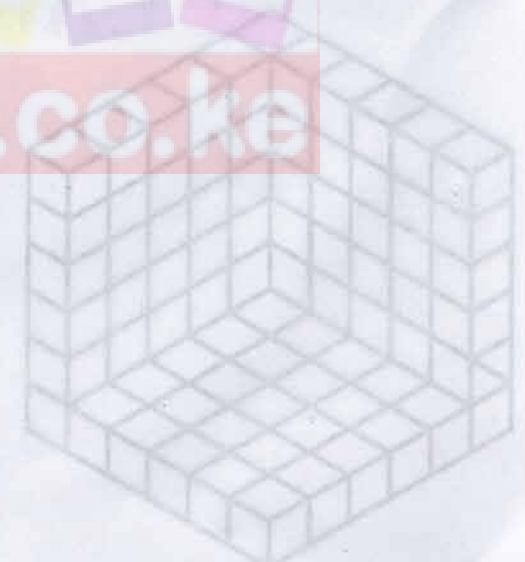
The sitting capacity of a bus is 45 passengers. If 11 passengers are absent, what is the percentage decrease in the sitting capacity?

- A. $24\frac{2}{3}\%$
- B. $24\frac{4}{11}\%$
- C. $24\frac{8}{11}\%$
- D. $28\frac{4}{11}\%$

46. Ochieng earns a salary of sh 14 000 every month. He spends sh 7 200 on food, sh 4 000 on house rent, sh 2 100 on utilities and saves the rest. A pie chart was drawn to show how Ochieng spent his salary. What was the size of the angle that represented the savings?

- A. 28°
- B. 24°
- C. 100°
- D. 180°

47. The figure shows an incomplete stack of cubes.



How many cubes are in the stacks?

- A. 216
- B. 128
- C. 108
- D. 91