
KENYA NATIONAL EXAMINATION COUNCIL

KCPE 2011

MATHEMATICS PAPER

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**MATHEMATICS**

Time: 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 only an ordinary pencil.
5. Make sure that you have written on the answer sheet:
YOUR INDEX NUMBER
YOUR NAME
NAME OF YOUR SCHOOL
6. By drawing a **dark line** inside the correct numbered boxes mark your full Index Number (i.e. School Code Number and the three-figure Candidate's Number) in the grid near the top of the answer sheet.
7. Do not make any marks outside the boxes.
8. Keep the sheet as clean as possible and do not fold it.
9. For each of the questions 1–50 four answers are given. The answers are lettered A, B, C and D. In each case only **ONE** of the four answers is correct. Choose the correct answer.
10. On the answer sheet the correct answer is to be shown by drawing a **dark line** inside the box in which the letter you have chosen is written.

Example

In the Question Booklet:

11. 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 (10).

On the answer sheet:

☐ [A]
 ☐ [B]
 ☒ [C]
 ☐ [D]

 ☐ [A]
 ☐ [B]
 ☐ [C]
 ☐ [D]

 ☐ [A]
 ☐ [B]
 ☐ [C]
 ☐ [D]

 ☐ [A]
 ☐ [B]
 ☐ [C]
 ☐ [D]

In the set of boxes numbered 11, the box with the letter C printed in it is marked.

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



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This Question Paper consists of 16 printed pages.

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**TURN OVER**

Working Space

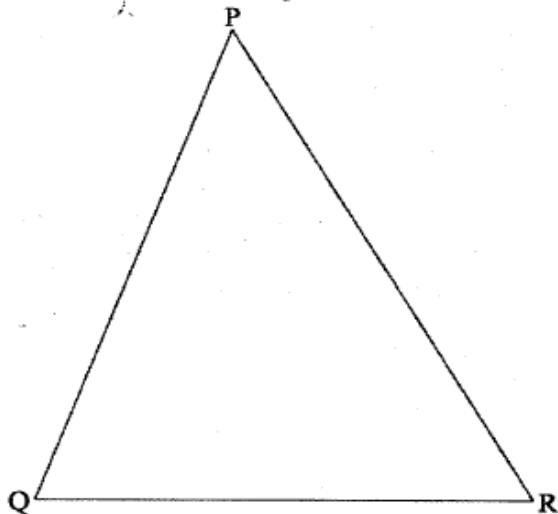
1. What is 9301854 written in words?
 - A. Nine million three thousand and one, eight hundred and fifty four.
 - B. Ninety three and one thousand, eight hundred and fifty four.
 - C. Nine million three hundred and one thousand eight hundred and fifty four.
 - D. Nine hundred and thirty thousand eighteen hundred and fifty four.
2. What is the value of $\frac{2(6^2 + 4^2)}{2(7 - 5)} - 8$?
 - A. 2
 - B. 14
 - C. 18
 - D. 24
3. What is 4.59954 written correct to three decimal places?
 - A. 4.599
 - B. 4.6
 - C. 4.60
 - D. 4.600
4. What is the L.C.M of 30, 45 and 60?
 - A. 15
 - B. 135
 - C. 180
 - D. 540
5. What is the place value of digit 2 in the product of the total value of digit 4 multiplied by the total value of digit 3 in the number 57438?
 - A. Ones
 - B. Tens
 - C. Hundreds
 - D. Thousands
6. Jebet bought the following items:
3 packets of maize flour at sh 90 each
2 kg of beans for sh 170
1½ kg of potatoes at sh 40 per kg
2 loaves of bread at sh 34 each.
If she had sh 800, how much money was she left with?
 - A. sh 62
 - B. sh 232
 - C. sh 466
 - D. sh 568

Working Space

7. What is the value of x in the equation

$$\frac{2(x+1)}{3} - 4 = 6?$$

- A. 14
B. 10
C. 8
D. 4
8. The area of a square is 3844cm^2 . What is the length of each side of the square?
A. 1922 cm
B. 961 cm
C. 67 cm
D. 62 cm
9. Which is the correct order of writing the fractions $\frac{2}{3}, \frac{4}{15}, \frac{1}{6}, \frac{1}{2}, \frac{2}{3}$ starting from the smallest to the largest?
A. $\frac{4}{15}, \frac{2}{3}, \frac{2}{3}, \frac{1}{6}, \frac{1}{2}$
B. $\frac{2}{3}, \frac{1}{2}, \frac{2}{3}, \frac{4}{15}, \frac{1}{6}$
C. $\frac{1}{2}, \frac{2}{3}, \frac{2}{3}, \frac{1}{6}, \frac{4}{15}$
D. $\frac{1}{6}, \frac{4}{15}, \frac{2}{3}, \frac{1}{2}, \frac{2}{3}$
10. In the triangle PQR below, construct the bisector of angle PQR to cut line PR at M and the bisector of angle QPR to cut line QR at N. The two bisectors intersect at point X. Join RX.



What is the size of angle RXM?

- A. 58°
B. 60°
C. 65°
D. 117°

Working Space

11. How many fencing posts, spaced 5 m apart, are required to fence a rectangular plot measuring 745 m by 230 m?
- A. 391
B. 390
C. 195
D. 196
12. Awinja bought a pair of shoes for sh 810 after getting a discount of 10%. What was the marked price of the pair of shoes?
- A. sh 81
B. sh 729
C. sh 891
D. sh 900
13. The table below shows the amount of milk delivered by a farmer to the dairy in 6 days.

DAYS	MON	TUE	WED	THUR	FRI	SAT
MILK IN LITRES	20	17	21	15	21	22

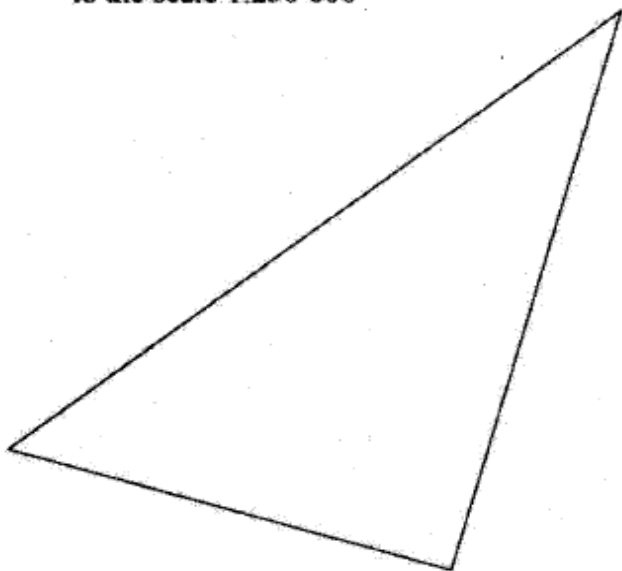
- What was the median sale of milk, in litres, for the 6 days?
- A. 18
B. $19\frac{1}{3}$
C. $20\frac{1}{2}$
D. 21
14. Mutiso and Oluoch shared the profit of their business such that Mutiso got $\frac{3}{5}$ of the profit. What was the ratio of Mutiso's share to Oluoch's share?
- A. 3 : 2
B. 5 : 3
C. 3 : 5
D. 2 : 3
15. What is the value of $\frac{0.5 + 0.2 \div 0.25}{0.2}$?
- A. 14
B. 6.5
C. 4.5
D. 2.75

Working Space

16. Mulwa had 5 one thousand shillings notes, 7 five hundred shillings notes, 10 two hundred shilling notes and 6 one hundred shillings notes. He then changed the money into fifty shillings notes. How many notes altogether did he get?

A. 555 000
B. 11 100
C. 2 220
D. 222

17. The figure below is a map of a village drawn to the scale 1:250 000



What is the perimeter of the village in kilometres?

A. 6000
B. 600
C. 60
D. 6

18. A cylindrical container has a circumference of 176 cm and a height of 40 cm. What is the volume of the container in cm^3 ? (Take $\pi = \frac{22}{7}$)

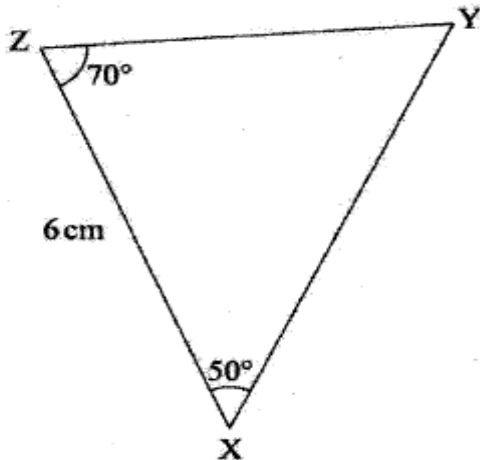
A. 394 240
B. 98 560
C. 7040
D. 3 520

Working Space

19. What is $\frac{1}{2}(3x+4y) + \frac{1}{3}(2x+7y) - 1\frac{1}{4}x - \frac{1}{2}y$ in simplified form?

- A. $\frac{13}{20}x + 2\frac{9}{10}y$
- B. $\frac{13}{20}x + 10\frac{1}{2}y$
- C. $3\frac{3}{20}x + 3\frac{9}{10}y$
- D. $4\frac{1}{4}x + 2\frac{9}{10}y$

20. The figure below is a sketch of a triangle XYZ in which angle ZXY = 50° , angle YZX = 70° and line ZX = 6 cm.



Which one of the statements below leads to the correct construction of the triangle?

- A. Use a ruler to draw line ZX = 6 cm long and drop a perpendicular from Y to ZX. Then join Y to X and to Z.
- B. Use a ruler to draw line ZX = 6 cm long and a pair of compasses to construct angle ZXY = 50° and YZX = 70° .
- C. Measure and draw the angles ZXY = 50° and YZX = 70° using a protractor and draw line ZX = 6 cm long.
- D. Use a ruler to draw line ZX = 6 cm long. Use a protractor to mark off an angle 70° at Z and angle of 50° at X. Let the lines formed by the angles meet at Y.

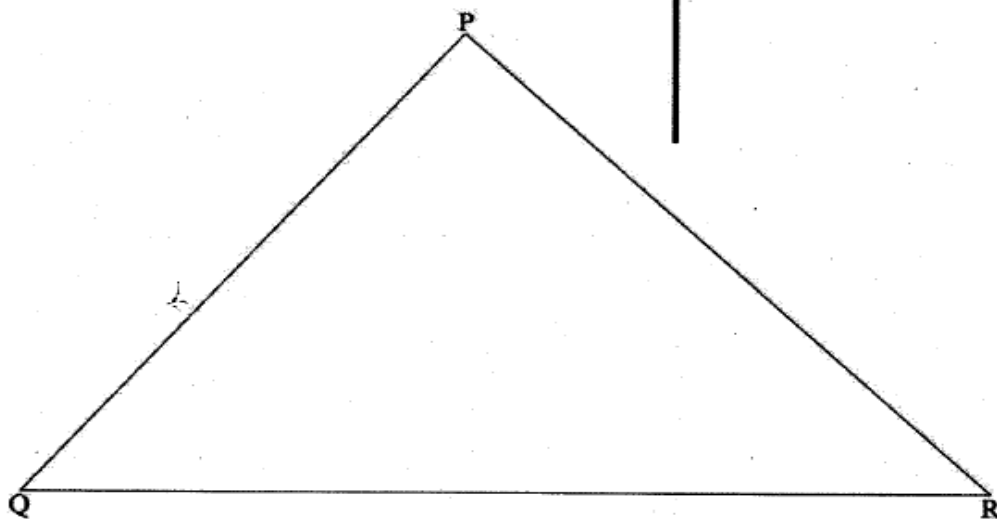
21. Each of the diagonals of a rectangular flower garden is 65 m. If one side of the garden measures 25 m, what is the measurement of the other side?

A. 90 m
B. 60 m
C. 40 m
D. 20 m

22. A meeting was attended by 150 people. Out of these, 0.14 were men, 0.2 were women and the rest were children. How many more children than women were there?

A. 69
B. 78
C. 99
D. 129

23. The triangle PQR shown below has been drawn accurately.



What is the size of angle QPR?

A. 95°
B. 85°
C. 50°
D. 45°

24. Mwaruwa is paid sh 3 750 after working for 25 days. How much money would he be paid if he does not work for 4 days?

A. sh 600
B. sh 4 464
C. sh 4 350
D. sh 3 150

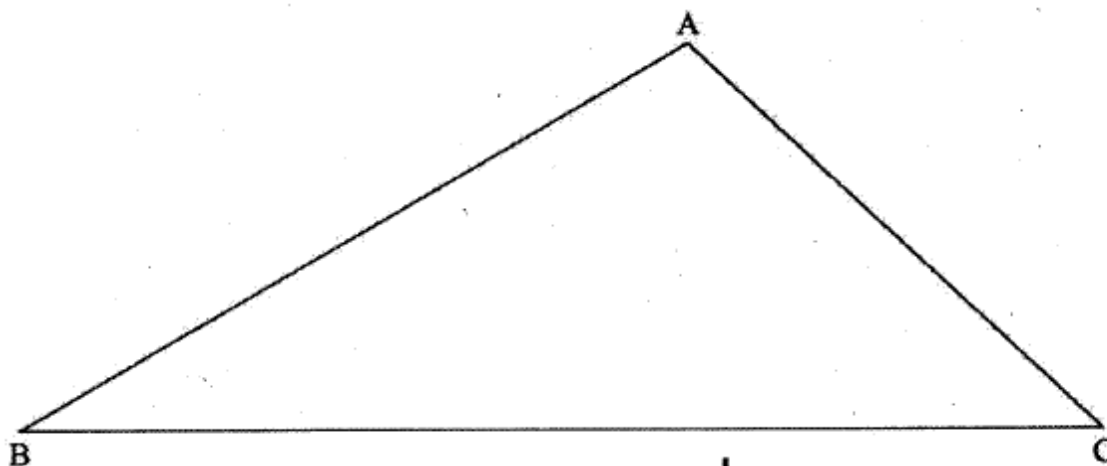
Working Space

Working Space

25. A family uses 5 decilitres of milk each day. How many litres of milk altogether would the family use in the months of June and July?

- A. 305
- B. 30.5
- C. 30.0
- D. 3.05

26. In the triangle ABC below, construct a perpendicular from A to meet line BC at N.

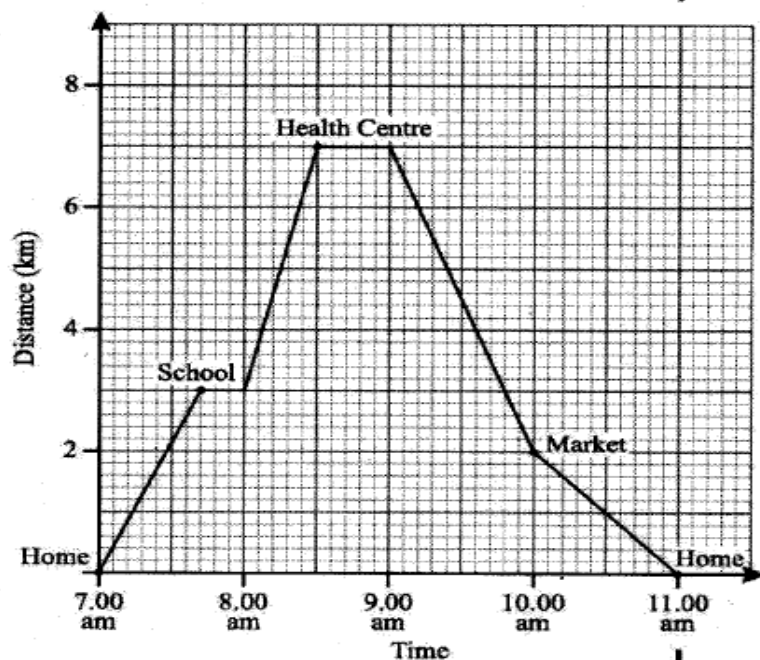


Which one of the following statements is correct?

- A. Line AN bisects line BC.
- B. Angle BAN is equal to angle CAN
- C. Angle ANB is equal to angle ANC
- D. Line AB is equal to line BN.

27. The graph below shows the journey made by a social worker on a certain day.

Working Space



Between which two places was his speed the highest?

- A. Home and school
 - B. School and health centre
 - C. Health centre and the market
 - D. Market and home.
28. What is the value of $\frac{p(2r+q)}{q} - r$, where

$$p=3, q-p=4 \text{ and } r=\frac{p+q}{2}?$$

- A. $8\frac{5}{7}$
 - B. $6\frac{4}{7}$
 - C. $2\frac{2}{7}$
 - D. $\frac{2}{7}$
29. What is the surface area of a cylindrical rod of height 17 cm and diameter 14 cm? (Take $\pi = \frac{22}{7}$)
- A. 748 cm^2
 - B. 902 cm^2
 - C. 1056 cm^2
 - D. 2728 cm^2

Working Space

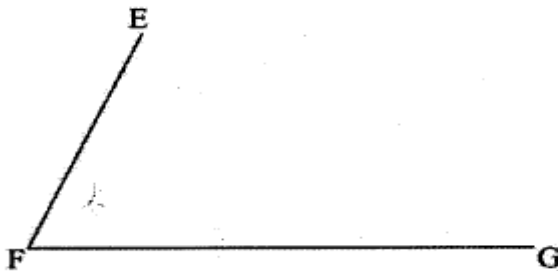
30. What is the value of $2\frac{1}{2} \div \frac{2}{3} + \frac{7}{8} \times \frac{5}{7} - 1\frac{2}{3}$ of $\frac{5}{6}$?

- A. $3\frac{5}{24}$
- B. $2\frac{23}{168}$
- C. $1\frac{97}{336}$
- D. $1\frac{1}{8}$

31. Halima bought 50 bananas @ sh3 each. She spent sh75 for transportation. During transportation 5 bananas got spoilt but she sold the rest making a 20% profit. For how much did she sell each banana?

- A. sh 4.00
- B. sh 5.40
- C. sh 5.60
- D. sh 6.00

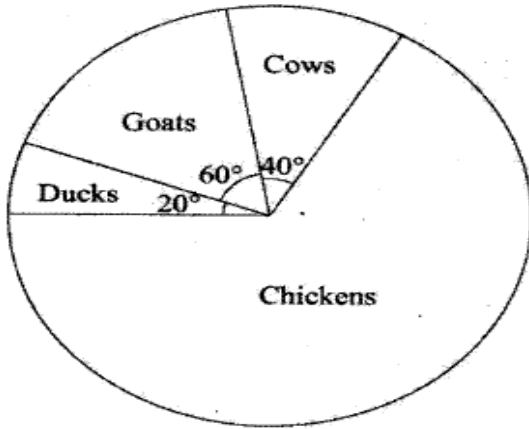
32. Two sides of a parallelogram EFGH have been drawn below. Complete the parallelogram EFGH. Draw diagonals EG and FH to intersect at J.



What is the length of line FJ?

- A. 2.7 cm
 - B. 3.5 cm
 - C. 4.4 cm
 - D. 6.5 cm
33. Mutuma left Mombasa on Tuesday at 6.30 p.m. and took 8 hours 45 minutes to reach his home. On what day and at what time in a 24 hour system did he reach home?
- A. Wednesday 0315 h
 - B. Wednesday 1515 h
 - C. Tuesday 1515 h
 - D. Tuesday 0315 h

34. The pie chart below represents the population of 1 800 animals in a farm.



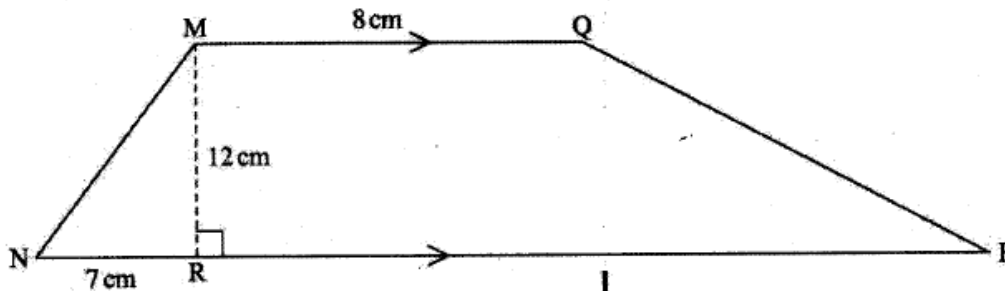
How many more chickens than goats are there in the farm?

- A. 300
B. 900
C. 1200
D. 180
35. A car travelled 216 km at an average speed of 48 km/h. On the return journey the average speed increased to 72 km/h. Calculate the average speed, in km/h, for the whole journey?
- A. 57.6
B. 60
C. 28.8
D. 68.6
36. Which one of the statements below is a property of a right angled triangle?
- A. All sides are equal.
B. Adjacent angles are supplementary.
C. Two of its sides are perpendicular.
D. The longest side of the triangle is opposite the smallest angle.
37. A mathematics text book has 97 sheets of paper and a cover. Each sheet of paper has a mass of 4 grams and the cover has a mass of 20 g. Find the mass of the book in kilograms.
- A. 0.408
B. 4.08
C. 40.8
D. 408

Working Space

Working Space

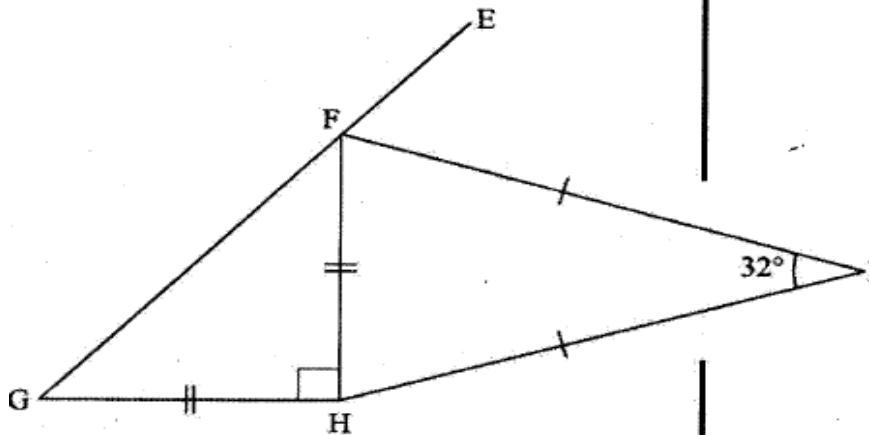
38. The diagram below is a trapezium $MNPQ$. Line MQ is parallel to line NP . The length of line $MQ=8\text{ cm}$ and that of line $NR=7\text{ cm}$. The perpendicular line $MR=12\text{ cm}$.



- If the area of the trapezium is 198 cm^2 , what is the length of RP ?
- A. 15 cm
B. 18 cm
C. 25 cm
D. 32 cm
39. Ali is now two years older than Martha. If Martha's age is represented by x , what will be their total ages after 10 years?
- A. $2x + 22$
B. $3x + 20$
C. $x + 22$
D. $2x + 18$
40. A football match was attended by 42000 men. The number of women who attended was 27000 less than the number of men and 12000 more than the number of children. The entrance fee for adults was sh100 and for children was sh50. How much money was collected altogether?
- A. sh 11 700 000
B. sh 7 500 000
C. sh 7 050 000
D. sh 5 850 000

Working Space

41. In the figure below EFG is a straight line. Lines GH and FH are equal and lines HI and FI are also equal. Angle GHF is a right angle and angle HIF is 32° . What is the size of angle EFI?



- A. 45°
- B. 61°
- C. 74°
- D. 103°

42. The table below shows part of Tariff for Ordinary Money Order and Postapay.

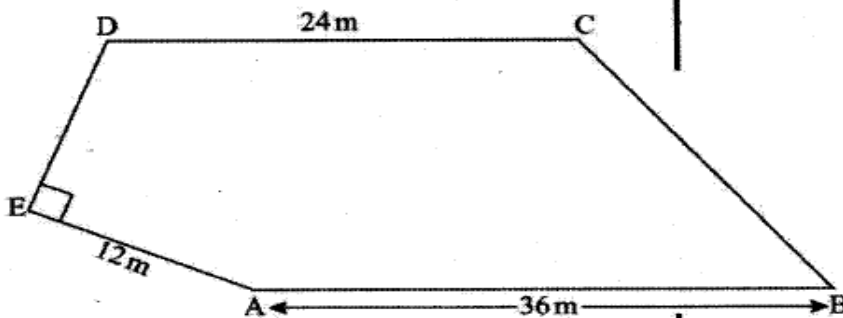
Range	Ordinary Money Order (sh)	Postapay (sh)
7 501–10 000	250	550
10 001–20 000	300	675
20 001–35 000	400	800
35 001–50 000	450	1 200
50 001–75 000	550	1 600

Karimi has two children in one school. To pay for their school fees he sent sh8 900 by Ordinary Money Order and sh15 400 by Postapay. How much money would he have saved had he bought one Ordinary Money Order to pay for all the fees?

- A. sh 125
- B. sh 400
- C. sh 525
- D. sh 925

Working Space

43. Nina is paid a basic salary of sh 8 000 as a sales agent. In addition she is paid a 5% commission for goods sold above sh 15 000. In one month she earned sh 12 000 altogether. What was the total sales?
- A. sh 255 000
B. sh 95 000
C. sh 80 000
D. sh 65 000
44. What is the next number in the pattern 4, 9, 25, 49, 121, 169, ---?
- A. 289
B. 256
C. 225
D. 196
45. The marked price of a motorcycle was sh 30 000 but a discount of 5% was allowed for cash payment. Taabu bought the motorcycle on hire purchase terms by paying a deposit of sh 8 500 followed by ten equal monthly instalments of sh 2 400 each. How much money would Taabu have saved had she bought it for cash?
- A. sh 4 000
B. sh 2 500
C. sh 1 500
D. sh 28 500
46. Figure ABCDE below represents a vegetable garden in which $AE = 12\text{ m}$, $AB = 36\text{ m}$ and $CD = 24\text{ m}$. Angle DEA is a right angle. The distance from A to D is 15 m. A perpendicular distance from C to AB is 10 m.



What is the area of the garden?

- A. 474 m^2
B. 390 m^2
C. 354 m^2
D. 300 m^2

Working Space

47. A tailor made 48 pieces of uniform. Half of the number of the uniforms was each made using $1\frac{1}{4}$ metres of material. A quarter of the remainder was each made using $1\frac{1}{2}$ metres of material and the rest was each made using $1\frac{3}{4}$ metres of material. The tailor also fixed a logo made using $\frac{1}{16}$ metres of material on each uniform.
How many metres of material did the tailor use?

- A. $73\frac{1}{2}$ metres
B. 72 metres
C. $70\frac{9}{16}$ metres
D. $70\frac{1}{2}$ metres

48. The table below shows the train fares for Nairobi–Mombasa route.

	1 st class sh	2 nd class sh
Adults	4 550	3 780
Children between 3–11 years	3 150	2 400
Children under 3 years	free	free

The following passengers travelled in the train:

23 pupils of age 12 years and above
12 pupils aged between 7 and 10 years
2 children below 3 years
3 parents
5 teachers
1 headteacher

The passengers occupied the following classes in the train:

1st class: Headteacher, 1 parent
2nd class: 5 teachers, 2 parents and all pupils and children

How much money did they pay for the journey to Mombasa?

- A. sh 119 560
B. sh 151 300
C. sh 156 100
D. sh 164 080

Working Space

49. A man deposited sh 50 000 in a bank for 2 years. The bank paid compound interest at the rate of 10% per annum. How much money was in his account at the end of the two years?

- A. sh 10 500
- B. sh 55 500
- C. sh 60 000
- D. sh 60 500

50. The figures below represent a pattern.



Which one of the following is the next shape in the pattern above?

