



004018383

THE KENYA NATIONAL EXAMINATIONS COUNCIL

KCPE 2014

1450311

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 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:

1 [A] [B] [C] [D] 11 [A] [B] ☒ [C] [D] 21 [A] [B] [C] [D] 31 [A] [B] [C] [D] 41 [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.



This question paper consists of 16 printed pages.

904503

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**TURN OVER**

1. In a certain country the population was 38898756. What was the population to the nearest ten thousand?

~~A. 38900000~~
~~B. 38890000~~
~~C. 38899000~~
~~D. 38898800~~

2. What is the largest 6-digit number written in words that can be formed using the symbols 4, 2, 0, 8, 3 and 6?

~~A. Four hundred and twenty thousand eight hundred and thirty six~~
~~B. Eight hundred and sixty four thousand three hundred and twenty~~
~~C. Eight million and sixty four thousand three hundred and twenty~~
~~D. Two hundred and three thousand four hundred and sixty eight~~

3. What is the value of

$$\frac{26 + 8^2 + 6^2 - 56 \div 7 \times 2}{(3+2)5}?$$

~~A. 4~~
~~B. $7\frac{3}{5}$~~
~~C. 22~~
~~D. $24\frac{2}{5}$~~

4. In the number 3078642, the total value of digit 7 is added to the total value of digit 4. Which one of the following is the correct answer?

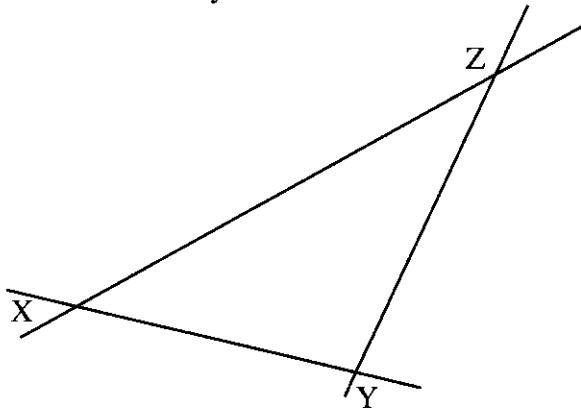
~~A. 70040~~
~~B. 70004~~
~~C. 7040~~
~~D. 740~~

5. What is the value of

$$\frac{3}{5} + \frac{1}{4} \left(\frac{1}{2} - \frac{1}{5} \right) \text{ of } \frac{2}{3} \div \frac{1}{3}?$$

A. $\frac{51}{100}$
 B. $\frac{13}{40}$
 C. $\frac{37}{60}$
 D. $\frac{3}{4}$

6. Triangle XYZ shown below, has been drawn accurately.



What is the measure of angle ZXY?

- A. 36°
- B. 42°
- C. 102°
- D. 138°

7. The following are prime factors of three numbers:

- (i) $2^2 \times 3^2$
- (ii) $2^3 \times 5$
- (iii) $2^4 \times 3^2$

What is the L.C.M. of the three numbers?

- A. 4
- B. 30
- C. 180
- D. 720

8. Which one of the following statements is correct?

- ☒ A. 0.27 is greater than $\frac{3}{11}$
- ☒ B. 0.27 is equal to $\frac{3}{11}$
- ☒ C. $\frac{3}{11}$ is greater than 0.27
- ☒ D. $\frac{3}{11}$ is less than 0.27

9. Which one of the following statements is true about the number of faces and edges of a square based pyramid?

- A. 5 faces and 5 edges
- B. 4 faces and 6 edges
- C. 5 faces and 8 edges
- D. 4 faces and 4 edges

$\frac{27}{100}$

10. In a certain month a businessman made a profit of sh 8 000. The following month his profit was sh 12 000. What was the percentage increase of the profit?

~~A. $66\frac{2}{3}\%$~~
~~B. 50%~~
~~C. $33\frac{1}{3}\%$~~
~~D. 20%~~

11. A rectangular tank is 7.5 m long, 5 m wide and 3.2 m high. How many litres of water can it hold when full?

~~A. 120~~
~~B. 1200~~
~~C. 12 000~~
~~D. 120 000~~

$$750 \times 500 \times 320 = 12000000$$

12. What is the value of x in the equation $x + 3(x + 3) = 23$?

~~A. $8\frac{1}{2}$~~
~~B. 8~~
~~C. $3\frac{1}{2}$~~
~~D. 5~~

$$x + 3x + 9 = 23$$

$$4x = 14$$

$$x = \frac{14}{4} = 3.5$$

13. Tuku spent $\frac{1}{3}$ of his money on school uniforms, $\frac{1}{4}$ on books, $\frac{2}{3}$ of the remainder on food and saved the rest. What total fraction of his money did he save and spend on books?

~~A. $\frac{7}{18}$~~
~~B. $\frac{5}{18}$~~
~~C. $\frac{5}{36}$~~
~~D. $\frac{7}{12}$~~

14. Kerubo bought a T.V. set by paying a deposit of sh 2 400 plus 15 equal monthly instalments of sh 500 each. The hire purchase price was 10% more than the marked price. What was the marked price?

~~A. sh 8 910~~
~~B. sh 9 000~~
~~C. sh 9 900~~
~~D. sh 11 000~~

Working Space

$$\frac{4000}{8000} = \frac{400}{8000} = \frac{1}{20}$$

$$x + 3(x + 3) = 23$$

$$x + 3x + 9 = 23$$

$$4x + 9 = 23$$

$$4x = 14$$

$$x = \frac{14}{4} = 3.5$$

$$\frac{2}{3} \times \frac{5}{6} = \frac{10}{18} = \frac{5}{9}$$

$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

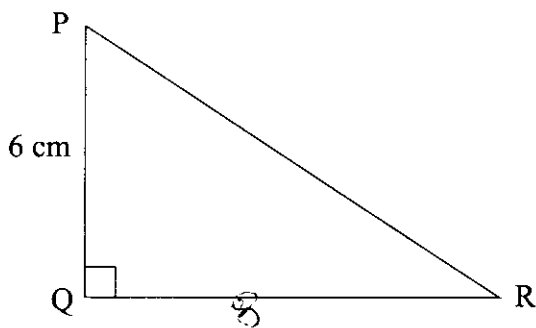
$$\frac{2}{3} - \frac{5}{18} = \frac{12}{18} - \frac{5}{18} = \frac{7}{18}$$

$$2400 + 15 \times 500 = 2400 + 7500 = 9900$$

$$9900 = 1.1 \times \text{marked price}$$

$$\text{marked price} = \frac{9900}{1.1} = 9000$$

15. The figure below represents a right-angled triangle PQR. The area of the triangle is 24 cm^2 and the height is 6 cm.



What is the length of the longest side?

- ☒ A. 7.2 cm
☐ B. 8 cm
☐ C. 10 cm
☐ D. 14 cm
16. The perimeter of a rectangular plot of land is 57.98 m. If the width of the plot is 8.6 m. What is its length?
- ☒ A. 20.39 m
☐ B. 24.69 m
☐ C. 40.78 m
☐ D. 49.38 m
17. The following are properties of a certain quadrilateral:
- (i) opposite sides are parallel
 - (ii) all sides are equal
 - (iii) opposite angles are equal
 - (iv) diagonals are unequal and bisect each other at right angles

What is the name of the quadrilateral?

- ☐ A. Rectangle
☐ B. Trapezium
☐ C. Rhombus
☐ D. Square

Working Space

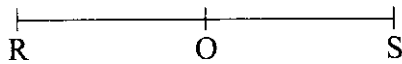
$$\frac{1}{2} \times t \times h = \frac{24}{3} \quad 36$$

$$\frac{1}{2} \times 6 \times 8$$

$$\begin{array}{r} 8.6 \\ 8.6 \\ \hline 17.2 \end{array}$$

$$\begin{array}{r} 57.98 \\ 17.2 \\ \hline 40.78 \end{array}$$

18. Construct a circle centre O using line ROS, given below, as diameter.



Construct angle $QRS = 30^\circ$. Mark point Q on the circumference and draw line QO. What is the size of angle QOS?

- A. 150°
- B. 120°
- C. 90°
- D. 60°

19. The table below shows the number of fruits sold by Fatuma and Bidii on a certain day. The number of Bananas sold by Fatuma and Bidii has not been shown.

FRUIT SELLER	FRUITS				
	Number of Oranges	Number of Melons	Number of Bananas	Number of Mangoes	Total
Fatuma	84	8		120	277
Bidii	135	12		60	315

How many more bananas did Bidii sell than Fatuma?

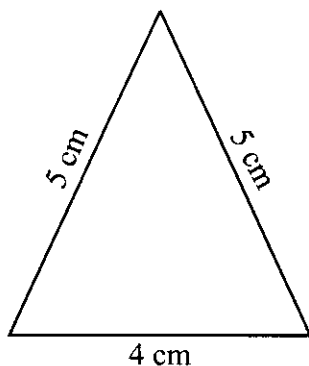
- A. 43
- B. 65
- C. 108
- D. 173

Working Space

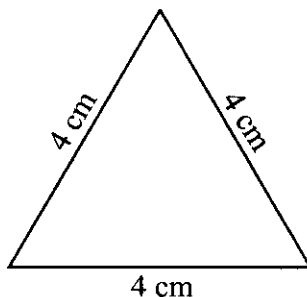
Fat 211

20. Below are four different types of triangles.

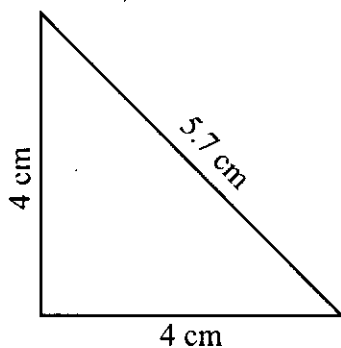
Working Space



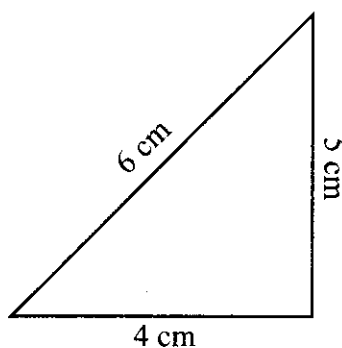
(i)



(ii)



(iii)



(iv)

Which one of the following pairs of triangles correctly describes the types of triangles above?

- ☒ A. (i) and (iii) are isosceles triangles
- ☒ B. (ii) and (iv) are scalene triangles
- ☒ C. (ii) and (iii) are right angled triangles
- ☒ D. (i) and (ii) are equilateral triangles

21. A road measuring 5 cm on a map has an actual distance of 15 kilometres. What is the scale used in drawing the map?

- ☒ A. 1:3
- ☒ B. 1:300
- ☒ C. 1:3 000
- ☒ D. 1:3 00 000

22. A car dealer was left with sh 855 000 after paying out a 5% commission to an agent for the sale of a car. What was the selling price of the car?

- A. sh 17 100 000
- B. sh 900 000
- C. sh 897 750
- D. sh 812 250

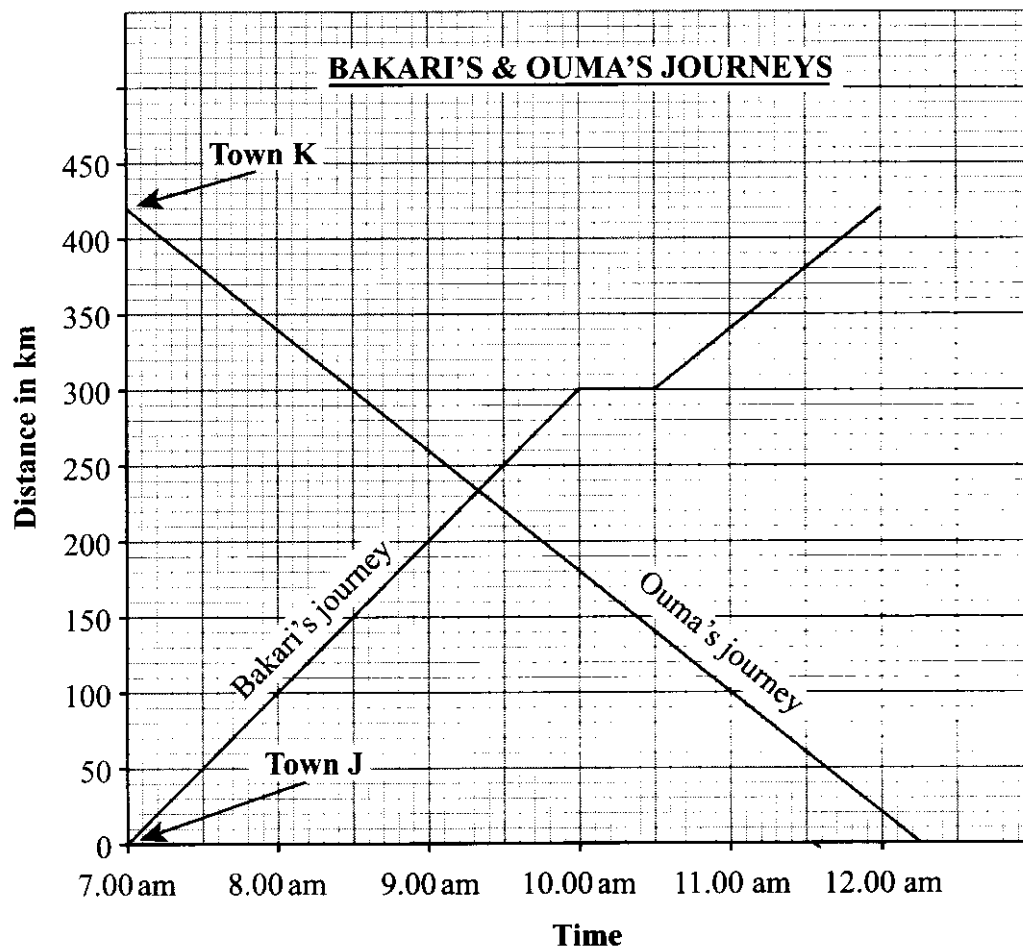
$$\frac{5}{150000} = \frac{1}{30000}$$

$$95 = 855000$$

$$\frac{100}{95} \times 855000$$

23. Below is a graph showing the journeys made by Bakari and Ouma. Both started at 7.00 am; Bakari started from town J to town K while Ouma started from town K to town J.

Working Space



After travelling for 3 hours, Bakari rested for 30 minutes. How far from town J was Ouma when Bakari started his rest?

- A. 300 km
- B. 240 km
- C. 180 km
- D. 140 km

24. What is the value of $\frac{2x + 3y + 4z}{(yz)^2}$

if $x = 2$, $y = \frac{x}{2}$ and $z = 3y$?

- A. 9
- B. $6\frac{1}{3}$
- C. $3\frac{1}{6}$
- D. $2\frac{1}{9}$

25. An open cylindrical tank has an internal diameter of 5.6 cm and an internal height of 4 cm. The inside of the tank was painted. What area of the tank, in square centimetres, was painted? (Take $\pi = \frac{22}{7}$)

A. 119.68
B. 95.56
C. 95.04
D. 70.04

26. Kibet left school by bicycle at 8.00 am and took $1\frac{1}{2}$ hours to reach the market 20 km away. Akinyi left the school for the market by car at 8.30 am. The average speed of the car was 80 km/h. What was the difference between their arrival times?

A. 1 hour 15 minutes
B. 45 minutes
C. 30 minutes
D. 15 minutes

27. Muli invested sh 10 000 in a bank which paid compound interest at the rate of 8% per annum. How much money did Muli have in the bank after two years, altogether?

A. sh 1 664
B. sh 11 600
C. sh 11 664
D. sh 10 864

28. What is the next number in the pattern

7, 12, 19, 30, 43, ____?

A. 79
B. 60
C. 49
D. 47

29. The table below shows a bus timetable for Isiolo to Mombasa route.

Name of Town	Isiolo	Nanyuki	Nyeri	Nairobi	Mtito Andei	Voi	Mombasa
Arrival time		2.00 pm	4.00 pm	8.00 pm	2.30 am	5.00 am	7.30 am
Departure time	12.30 pm	2.30 pm	4.15 pm	9.30 pm	3.00 am	5.15 am	

How long is a bus expected to take to travel from Nyeri to Mtito Andei?

A. 10 h 15 min
B. 10 h 30 min
C. 10 h 45 min
D. 11 h

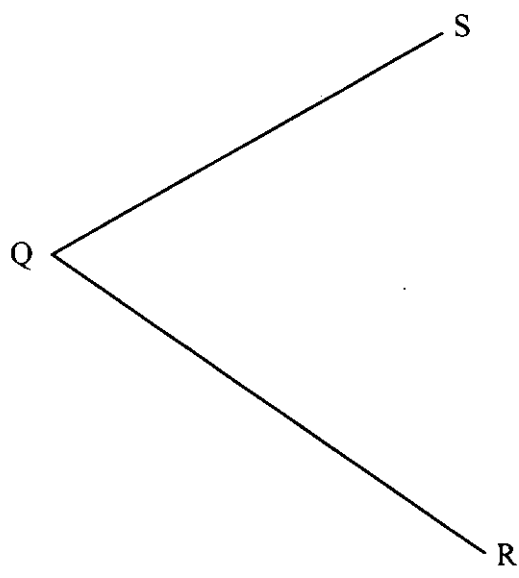
Working Space

$$110^2 + 110 \times 4$$

$$\left(\frac{22}{7} \times 2.8 \times 2.8 \right) + 110 \times 4 = 119.68$$

$$\begin{array}{r} 5.7113 \\ 7 \overline{) 12193043} \\ \underline{7} \\ 5 \\ \underline{14} \\ 19 \\ \underline{30} \\ 13 \\ \underline{43} \\ 17 \end{array}$$

30. Below is part of a rhombus PQRS. Line QS is one of the diagonals and line QR is one of the sides of the rhombus. Complete the rhombus.



What is the difference in the lengths of the diagonals?

- A. 6 cm
 - B. 6.5 cm
 - C. 12.5 cm
 - D. 18.5 cm
31. Sixty people were hired to complete construction of a road in 6 days. Forty of the people did not turn up. How many more days did it take the remaining people to complete the construction?
- A. 24
 - B. 18
 - ☒ C. 12
 - D. 3
32. Kadogo was born on 4th January 2009. How old was he on 4th March 2011?
- ☒ A. 2 years 62 days
 - B. 2 years 61 days
 - C. 2 years 59 days
 - D. 2 years 60 days

Working Space

Man days
 60 6
 20 ?

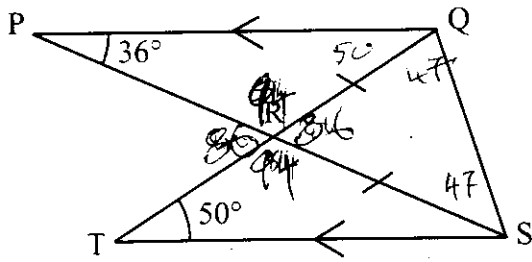
(Handwritten calculation: 60 / 6 = 10, 20 / 10 = 2)

2010
 F M A M J J A S O N D
 5 2011 F M

4th Jan 2009 5 Feb 2011

28
 4
 32
 30

33. In the figure below, lines PQ and TS are parallel. Lines RQ and RS are equal. Angle QPR = 36° and angle STR = 50° .



What is the size of angle PQS?

- ~~A. 47°~~
~~B. 86°~~
~~C. 94°~~
~~D. 97°~~
34. The area of a square garden is 3136 m^2 . What is the length of one side of the garden in metres?
- ~~A. 14~~
~~B. 56~~
~~C. 784~~
~~D. 1568~~
35. The table below shows the International Postage charges for surface mail.

TYPE OF ARTICLE AND MAXIMUM MASS	Countries within East Africa zone		Countries within the rest of Africa zone		Countries within Europe, Middle & Near East zone		Australia, America & Far East zone	
	sh	ct	sh	ct	sh	ct	sh	ct
LETTERS Maximum Mass 2 kg								
Up to 20 g	45	00	55	00	60	00	70	00
Over 20 g up to 100 g	90	00	105	00	115	00	150	00
Over 100 g up to 250 g	150	00	180	00	205	00	260	00
Over 250 g up to 500 g	270	00	315	00	360	00	465	00
Over 500 g up to 1 kg	450	00	525	00	600	00	770	00
Over 1 kg up to 2 kg	735	00	835	00	970	00	1335	00

Chebet sent a 150 g letter to her friend in Nigeria, a 1.5 kg letter to her friend in Europe and a 1 kg letter to a friend in America. How much did she pay for the postage of the letters?

- ~~A. sh 1 890~~
~~B. sh 1 920~~
~~C. sh 2 285~~
~~D. sh 2 485~~

Working Space

$$\begin{array}{r} 180 \\ 86 \\ \hline 94 \end{array}$$

$$\begin{array}{r} 360 \\ 168 \\ \hline 92 \\ \hline 46 \end{array}$$

$$\begin{array}{r} 180 \\ 46 \\ \hline \end{array}$$

$$\begin{array}{r} 55 \\ 3136 \\ 25 \\ \hline 636 \end{array}$$

$$\begin{array}{r} 106 \\ \times 6 \\ \hline 636 \end{array}$$

$$\begin{array}{r} 1890 \\ 640 \\ 770 \\ \hline \end{array}$$

36. A train left station P on Tuesday at 20 15h and took $4\frac{1}{2}$ hours to reach town Q. On what day and at what time in am/pm system did the train arrive at station Q?

~~A. Wednesday 12.45 a.m~~
~~B. Wednesday 12.45 p.m~~
~~C. Tuesday 12.45 a.m~~
~~D. Tuesday 12.45 p.m~~

37. Maria bought 3 trays of eggs each containing 30 eggs. She paid sh 270 for each tray of eggs. Nine eggs were eaten at home and the rest were sold. If Maria made a profit of 20%, how much did she sell each egg?

~~A. sh 15.50~~
~~B. sh 12.00~~
~~C. sh 10.80~~
~~D. sh 8.00~~

38. The perimeter of a rectangular field is 56 m. The length of one of its sides is 7 m. What is the area of the field?

~~A. 392 m²~~
~~B. 294 m²~~
~~C. $171\frac{1}{2}$ m²~~
~~D. 147 m²~~

39. The total amount of milk produced by a certain cow in ten days was 115 litres. The daily produce in nine of the days was recorded in litres as 13, 12, 15, 9, 8, 7, 13, 13 and 15. What was the median produce in the ten days?

~~A. 13 l~~
~~B. 10 l~~
~~C. 11.5 l~~
~~D. 12.5 l~~

Working Space

$$\begin{array}{r} 270 \\ \times 3 \\ \hline 810 \end{array}$$

$$\begin{array}{r} 90 \\ 81 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 126 \\ \times 81 \\ \hline 1008 \\ 10080 \\ \hline 10206 \end{array}$$

$$\begin{array}{r} 512 \\ \times 16 \\ \hline 3072 \end{array}$$

$$\begin{array}{r} 162 \\ \times 81 \\ \hline 1312 \end{array}$$

$$\begin{array}{r} 21 \\ \times 7 \\ \hline 147 \end{array}$$

$$\begin{array}{r} 50 \\ \times 2 \\ \hline 100 \end{array}$$

$$\begin{array}{r} 81 \\ \times 972 \\ \hline 729 \\ 7290 \\ 72900 \\ \hline 79032 \end{array}$$

$$\begin{array}{r} 2400 \\ - 2015 \\ \hline 385 \end{array}$$

$$\begin{array}{r} 430 \\ - 345 \\ \hline 85 \end{array}$$

$$\begin{array}{r} 115 \\ - 105 \\ \hline 10 \end{array}$$

40. The number of people who visited a game park on Monday was 65, on Tuesday was 49 and on Wednesday was 58. On Thursday the number of people was 12 less than those who visited the park on Wednesday. The number of people who visited the game park on Friday was half the number that visited the game park on Saturday. A total of 374 people visited the game park during the six days. How many people visited the game park on Friday?

☒ A. 104
☐ B. 78
☐ C. 52
☐ D. 44

41. Which one of the expressions below is the simplest form of $\frac{6(p+3r)+p}{4(2r+p)-r}$?

A. $\frac{7p+3r}{p+7r}$
 B. $\frac{4p+qr}{3r+2p}$
 C. $\frac{12p+18r}{4r+4p}$
☒ D. $\frac{7p+18r}{4p+7r}$

42. Simuyu paid sh 1 560 to buy a blanket after getting $2\frac{1}{2}\%$ discount. How much less would he have paid had he been offered a 4% discount?

☒ A. sh 24
☐ B. sh 40
☐ C. sh 64
☐ D. sh 1536

97.5 → 1560
 100 → 1600

$$\frac{6p + 18r + p}{8r + 4p - r} = \frac{7p + 18r}{7r + 4p}$$

Mon	Tue	Wed	Thurs	Friday	Saturday
65	49	58	(58-12)	$\frac{1}{2} \times 58$	76
			46		

$218 + 156 = 374$

$\frac{218}{3} = 72.66$
 $\frac{156}{3} = 52$

15

43. The table below shows how Mutua utilized his farm.

Working Space

Activity	Maize farming	Sugar cane growing	Vegetable growing	Grazing	Homestead
Size of farm in hectares	6	10	5	7	2

If a pie chart was drawn to represent the use of the farm, by how many degrees more would the angle sector representing sugarcane growing be than the angle sector representing grazing?

- ~~A. 204°~~
~~B. 120°~~
~~C. 84°~~
~~D. 36°~~

44. A lorry was packed with cartons each containing packets of cooking fat. There were packets of 500 g and 250 g. The total mass of the packets was 900 kg. If the number of 500 g packets was 1000, what was the number of 250 g packets?

- ~~A. 1600~~
~~B. 800~~
~~C. 400~~
~~D. 100~~

$$\begin{array}{r} 500 \text{ g} \\ 400 = \\ 400000 \\ \hline 250 \\ 16000 \end{array}$$

500000

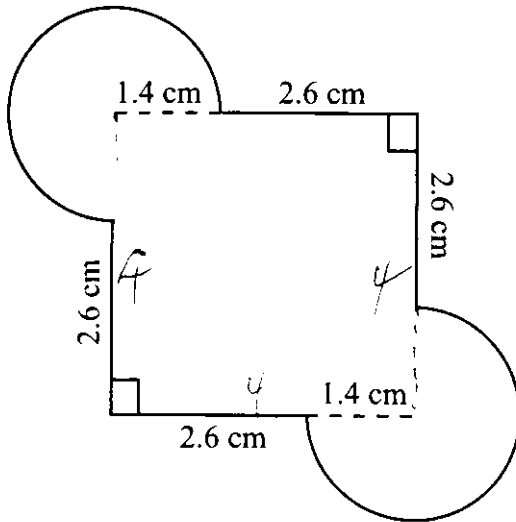
$$\begin{array}{r} 100000 \\ \hline 250 \end{array}$$

$$\begin{array}{r} 10 \\ 10 \times 360 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 120 \\ 84 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ 7 \times 360 \\ \hline 36 \end{array}$$

45. A design was made up of straight edges of length 2.6 cm and arcs of circles of radii 1.4 cm as shown in the figure below.



What is the area of the design?

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

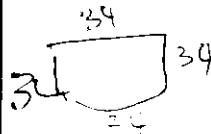
- ☒ A. 16.00 cm²
☒ B. 22.16 cm²
☒ C. 25.24 cm²
☒ D. 28.32 cm²
46. The area of a square plot of land is 1156 m². The plot is to be fenced with three strands of wire. What is the length of the wire that is needed?
- ☒ A. 867 m
☒ B. 408 m
☒ C. 136 m
☒ D. 102 m
47. A tank contained 22.5 m³ of water. More water was poured into the tank at the rate of 1.45 m³ per minute. The tank was full at the end of 30 minutes. What is the capacity of the tank in litres?
- ☒ A. 23 950
☒ B. 43 500
☒ C. 66 000
☒ D. 718 500

Working Space

16

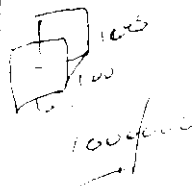
$$\frac{3}{4} \times \frac{22}{7} \times 1.4 \times 1.4 \times 2$$

$$= 3.3 \times 0.14 \times 2$$



$$24.5 \times 3$$

$$\frac{1.45 \times 30}{3}$$



$$\frac{1.45 \times 30}{3}$$

$$= \frac{43.5}{3}$$

$$= 14.5$$

- 48.** Wanja bought 2 kg of peas @sh 80, 3 kg of maize @ sh 60 and 10 kg of potatoes for sh 100. If Wanja spend sh x to buy the peas, sh y to buy the maize and sh z to buy the potatoes, which one of the equations below represents the total amount of money spent by Wanja?

~~A. $x + y + z = 440$~~

~~B. $x + y + z = 240$~~

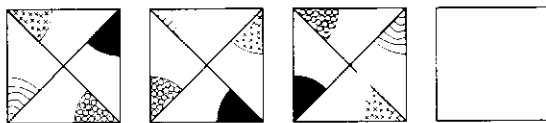
~~C. $x + y + z = 340$~~

~~D.~~ $x + y + z = 1\,340$

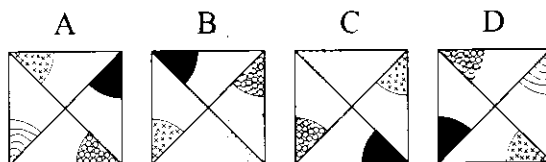
- 49.** Mwachia and Mbuu shared some money in the ratio 5:2. Mbuu received sh 30 less than Mwachia. How much money did Mbuu get?

- A. sh 20
B. sh 50
C. sh 70
D. sh 80

- 50.** The figure below shows a pattern of shapes.



Which one of the shapes below should be drawn in the blank box above to continue with the pattern?



Working Space

$$\begin{array}{r} 160 - 10 \\ 150 \\ - 100 \\ \hline 400 \end{array}$$

5.2

20