

THE KENYA NATIONAL EXAMINATIONS COUNCIL



KCPE 2016

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 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:**

44. What is 1.28978 correct to three decimal places?

- A. 1.28
- B. 1.289
- C. 1.29
- D. 1.290

The correct answer is D (1.290)

On the answer sheet:

<input checked="" type="checkbox"/> 4	[A]	[B]	[C]	[D]	<input checked="" type="checkbox"/> 14	[A]	[B]	[C]	[D]	<input checked="" type="checkbox"/> 24	[A]	[B]	[C]	[D]	<input checked="" type="checkbox"/> 34	[A]	[B]	[C]	[D]	<input checked="" type="checkbox"/> 44	[A]	[B]	[C]	<input checked="" type="checkbox"/> 54
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In the set of boxes numbered 44, the box with the letter D 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.



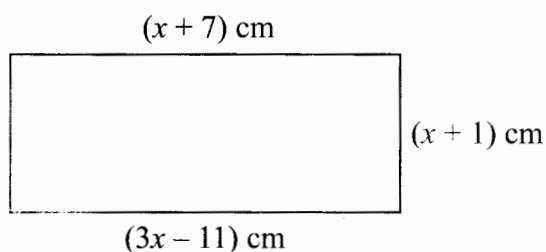
Working Space

1. What is thirteen million, eleven thousand one hundred and one in symbols?
A. 1311101
B. 13011011
C. 13110101
D. 13011101
2. How many groups of a hundred are there in the total value of digit 5 for the number 450319.2?
A. 50
B. 500
C. 5 000
D. 50 000

3. What is the value of

$$\frac{0.21 \times 0.35 \times 26.7}{4.9 \times 0.015 \times 8.9} ?$$

- A. 0.03
 - B. 0.3
 - C. 3
 - D. 30
4. The figure drawn below is a rectangle.



What is the perimeter of the rectangle?

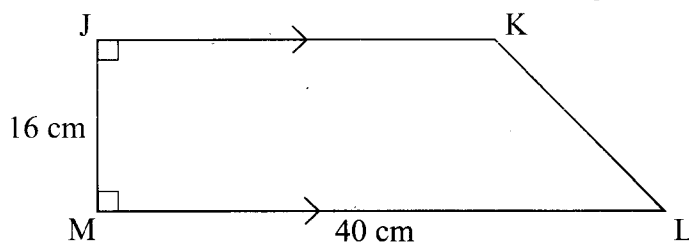
- A. 52 cm
 - B. 42 cm
 - C. 26 cm
 - D. 9 cm
5. What is 340068 divided by 17?
A. 20 004
B. 2 004
C. 204
D. 24
 6. What is the difference between LCM of 12 and 24 and the GCD of 54 and 36?
A. 42
B. 24
C. 18
D. 6



7. What is the value of

$$\frac{1}{4} \div \frac{1}{2} \text{ of } \frac{1}{2} + \left(\frac{2}{3} - \frac{1}{6}\right)?$$

- A. $1\frac{1}{2}$
 B. $1\frac{1}{6}$
 C. $\frac{3}{4}$
 D. $\frac{9}{16}$
8. What is the next number in the pattern
 3, 10, 5, 12, 7, 14, 9, 16, ...?
 A. 11
 B. 18
 C. 21
 D. 23
9. The area of the trapezium JKLM drawn below is 544 cm^2 . Line JK is parallel to line LM and line JM is the perpendicular distance.



What is the length of line KL?

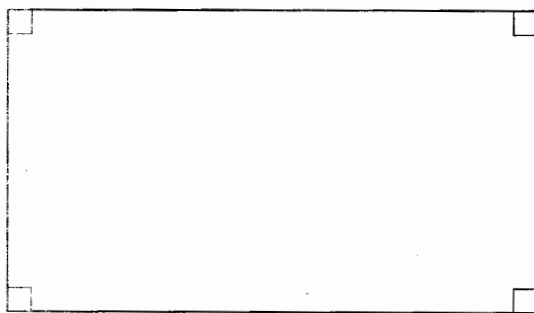
- A. 12 cm
 B. 16 cm
 C. 20 cm
 D. 28 cm
10. Six men can complete a job in 20 days. If the men work at the same rate, how many more are needed to complete the job in 12 days?
 A. 16
 B. 10
 C. 8
 D. 4
11. The mean of ten numbers is 5.8. Nine of the numbers are 5, 9, 3, 7, 6, 4, 6, 5 and 7. What is the product of the mode and median of the numbers?
 A. 54
 B. 36
 C. 30
 D. 12

Working Space



Working Space

12. A businessman borrowed sh 40 000 from a lending institution at a simple interest rate of $2\frac{1}{2}\%$ per month. How much did he pay back at the end of one year?
- A. sh 1 000
B. sh 12 000
C. sh 41 000
D. sh 52 000
13. What is the value of $\frac{2r^2 - t + s}{s - t}$ when $r = 4, s = t + 2$ and $t = r - 1$?
- A. 37
B. 17
C. 12
D. 9
14. A vendor sold $\frac{2}{5}$ of fruits to motorists and $\frac{1}{4}$ to students. He also sold $\frac{3}{7}$ of the remaining fruits to others. If the vendor was left with 168 fruits, how many fruits were sold to students?
- A. 126
B. 210
C. 336
D. 840
15. The diagram below shows a plot of land drawn to scale 1:100 000.



What is the actual area of the plot, in acres?

- A. 28
B. 2 800
C. 280 000
D. 28 000 000
16. Juma paid sh 11 900 for a bicycle after getting a discount of 15%. How much more would he have paid had he been given a discount of 10%?
- A. 1 260
B. 2 100
C. 1 400
D. 700



17. A 26-seater bus and a 14-seater *matatu* were to transport 494 pupils to a sports meeting. If the *matatu* made an extra trip than the bus, how many pupils did the *matatu* transport?
- A. 312
B. 182
C. 168
D. 13
18. Using a pair of compasses and a ruler construct a triangle UVW such that lines $VW = 7$ cm, $UV = 8$ cm and $UW = 6$ cm. Draw a circle which passes through U , V and W .

Working Space

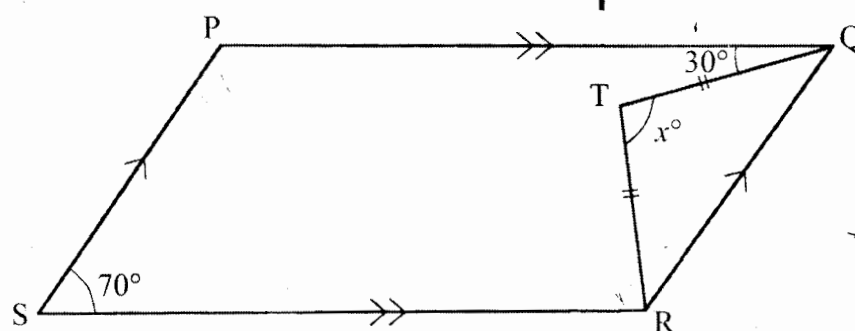
What is the length of the radius of the circle?

- A. 2.0 cm
B. 3.9 cm
C. 4.2 cm
D. 8.3 cm



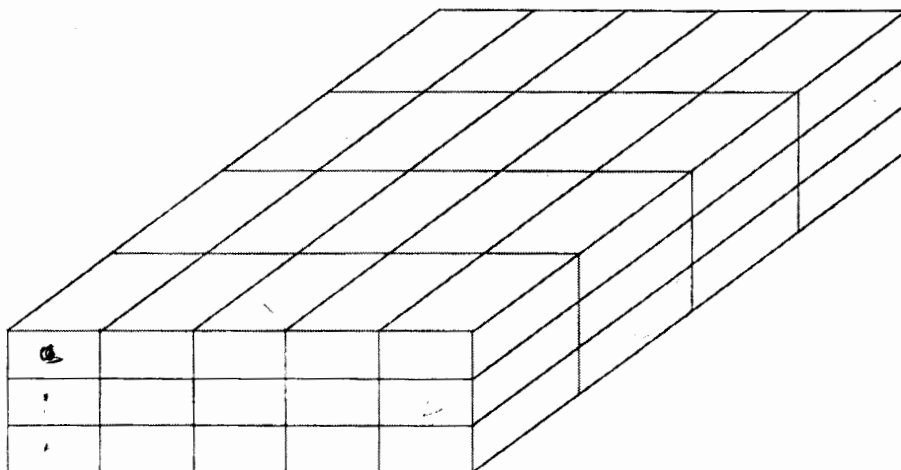
19. The figure PQRS drawn below is a parallelogram. Angle PSR = 70° , angle PQT = 30° and line TQ = line TR.

Working Space



What is the size of the angle marked x ?

- A. 70°
 B. 80°
 C. 100°
 D. 120°
20. A children's home was supplied with 40 cartons of milk. Each carton contained 60 two-hundred millilitre packets of milk. How many litres of milk were supplied?
- A. 480 000
 B. 4 800
 C. 2 400
 D. 480
21. The following stack of cubes was dipped in paint.



How many cubes had paint on two faces only?

- A. 9
 B. 22
 C. 24
 D. 60



22. A dairy farmer sold milk from 8th December 2011 to 8th March 2012. How many days did the farmer sell the milk?

A. 90
B. 91
C. 92
D. 93

23. In a school the ratio of boys to girls is 3:2. There are 600 pupils in the school. During an athletic competition $\frac{1}{6}$ of the girls and $\frac{1}{5}$ of the boys took part. How many pupils took part in the competition?

A. 448
B. 288
C. 200
D. 112

24. The table below shows the number of pupils absent from a class of 42 pupils, in a certain week.

	Mon	Tue	Wed	Thur	Fri
Girls	4	3	2	3	5
Boys	2	3	3	2	3

What was the total class attendance for that week?

A. 12
B. 30
C. 180
D. 210

25. Construct a parallelogram **WXYZ** such that lines **WZ** = 5 cm and **XY** = 7.5 cm. Angle **WZY** = 135°. Join **W** to **Y** and **Z** to **X** and let the point of intersection be **O**. What is the length of line **WO**?

A. 2.6 cm
B. 5.2 cm
C. 5.8 cm
D. 11.6 cm

26. What is $\frac{3}{7}(21m + 42n) + \frac{5}{6}(18m - 18n)$ expressed in its simplest form?

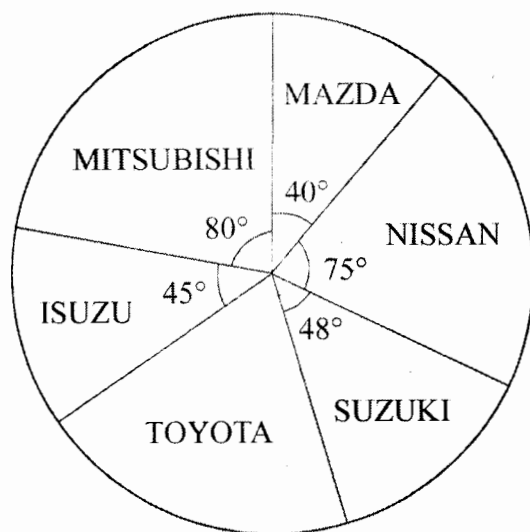
A. $6m - 3n$
B. $24m - 3n$
C. $24m - 3n$
D. $24m - 33n$

Working Space



27. A sales agent is paid a basic salary of sh 12 000 and a commission of 3% for goods sold above sh 50 000. In a certain month, his total earnings were sh 15 000. What was the value of the total sales?
- A. sh 51 500
B. sh 65 000
C. sh 100 000
D. sh 150 000

28. The pie chart below represents the types of vehicles imported in Kenya in a certain year.



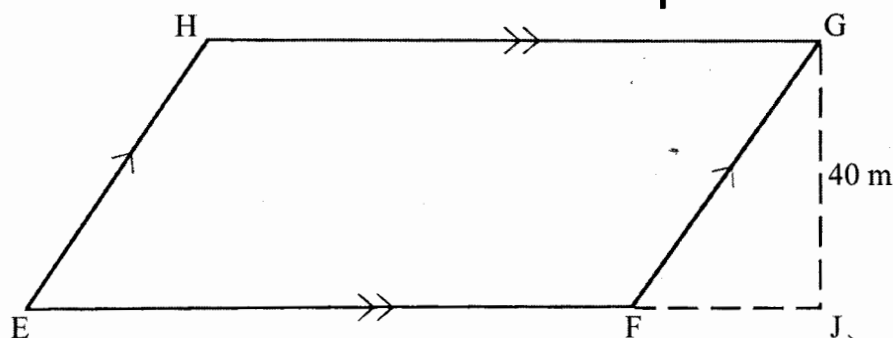
If 16 000 Mazdas were imported, how many more Toyotas than Suzukis were imported?

- A. 48 000
B. 28 800
C. 19 200
D. 9 600
29. A train left town **Q** on Thursday at 6.45 pm and took 9 hours 30 minutes to reach town **R**. At what time and day did it reach town **R** in 24 hour clock system?
- A. 0315 h Friday
B. 0415 h Friday
C. 0415 h Thursday
D. 1615 h Thursday
30. A cylindrical tank whose height is 3.5 m has a diameter of 2.8 m. If it is $\frac{3}{5}$ full of water, how many more litres are needed to fill the tank? (Take $\pi = \frac{22}{7}$).
- A. 8 624
B. 12 936
C. 21 560
D. 34 496

Working Space



31. In the quadrilateral **EFGH** drawn below, line **EF** is parallel to **GH**. The dotted line **JG** is the perpendicular height. The area of the quadrilateral is $3\,600\text{ m}^2$.



Working Space

What is the length of line **EF**?

- A. 72 m
B. 75 m
C. 90 m
D. 120 m
32. Halima bought the following items from a shop.
- 2 kg of sugar @ sh 112.00
 - 4 packets of $\frac{1}{2}$ litre milk @ sh 40.00
 - $1\frac{1}{4}$ kg cooking fat at sh 120 per kg
 - 2 kg of wheat flour for sh 210
 - $1\frac{1}{2}$ kg of salt at sh 24 per kg
- She paid for the items using two 500 shilling notes. How much balance did she receive?
- A. sh 220
B. sh 300
C. sh 494
D. sh 780
33. A watch loses 5 seconds every hour. The watch was set correct on Wednesday at 6.30 am. What time did it show at 6.30 pm the next Wednesday?
- A. 6.15 pm
B. 6.16 pm
C. 6.29 pm
D. 6.45 pm
34. A man was 27 years older than his son ten years ago. His wife is 4 years younger than he is. If their total age is 116 years now, how old is the son?
- A. 12
B. 22
C. 45
D. 49

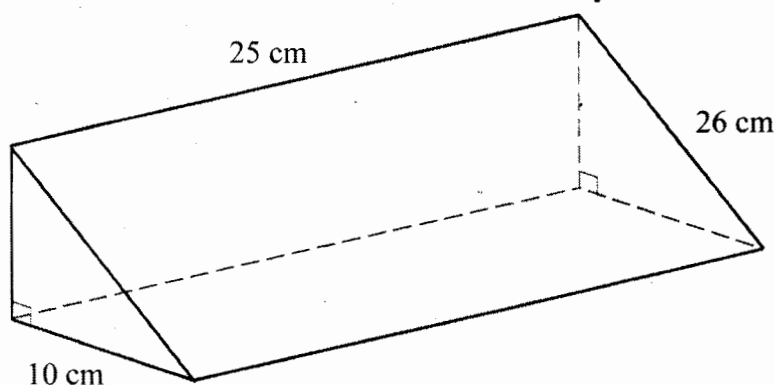


35. The table below shows commission charged on postal orders.

Value of Order	Commission
1 000	33.00
2 000	36.00
3 000	69.00
4 000	117.00

Mary was to send sh 7 000 using postal orders. Which one of the following combinations of value of orders shows the least commission she would be charged?

- A. sh 4000, sh 1000, sh 1000 and sh 1000
 B. sh 3000, sh 3000 and sh 1000
 C. sh 4000 and sh 3000
 D. sh 2000, sh 2000, sh 2000 and sh 1000
36. What is the value of x in the equation $\frac{x}{4} + \frac{x-3}{2} = 3$?
- A. 2
 B. 3
 C. 5
 D. 6
37. The area of a square plot of land is 3.24 hectares. The owner of the plot wanted to fence all round placing posts at intervals of 5 metres. How many posts were required?
- A. 720
 B. 180
 C. 145
 D. 144
38. The figure drawn below is a right-angled triangular prism.



What is the volume of the prism?

- A. 3 000 cm³
 B. 3 200 cm³
 C. 6 000 cm³
 D. 6 500 cm³

Working Space



Working Space

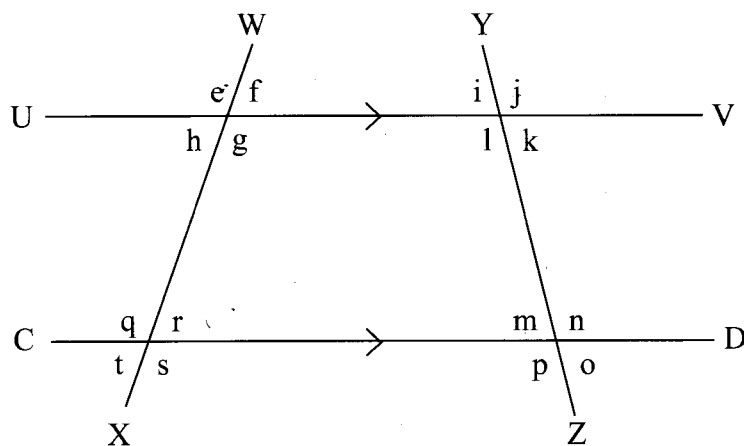
39. In an election, three candidates took part. The winning candidate got 0.429 of the votes cast while the other two got 0.386 and 0.184 respectively. There were 84 spoilt votes. How many votes did the winner get?

A. 15 456
B. 32 424
C. 36 036
D. 84 000

40. A lorry was loaded with 150 cartons of cooking fat and 120 bales of flour. Each carton of cooking fat contained twelve 2 kg tins. The mass of an empty carton was 500 grams. Each bale of flour contained twelve 2 kg packets. What was the total load in tonnes?

A. 6.480
B. 6.555
C. 6.615
D. 6.555

41. In the figure below lines **UV** and **CD** are parallel. Lines **WX** and **YZ** are transversals.

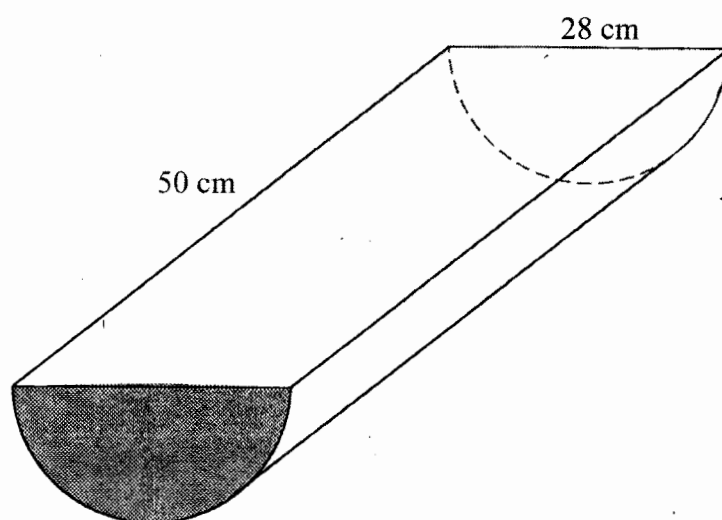


Which one of the following statements is **true** about the figure?

- A. angles r and l are co-interior
B. angle j is vertically opposite to angle n
C. angle e is alternate to angle t
D. angle r corresponds to angle f



42. A farmer harvested 1 200 crates of tomatoes in the year 2011. This was a 20% decrease from the year 2010. How many crates of tomatoes did the farmer harvest in the year 2010?
- A. 1 500
B. 1 440
C. 960
D. 240
43. The figure below represents a half of a cylindrical piece of wood of diameter 28 cm and a length 50 cm.



What is the surface area of the wood?

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

- A. 6 416 cm²
B. 4 216 cm²
C. 3 908 cm²
D. 2 816 cm²
44. Chepkoech has k bananas. Omollo has two more bananas than Chepkoech. Nekesa has three bananas less than the total number that both Chepkoech and Omollo have. How many bananas do they have altogether?
- A. $4k + 1$
B. $4k + 3$
C. $4k + 4$
D. $4k + 7$

Working Space

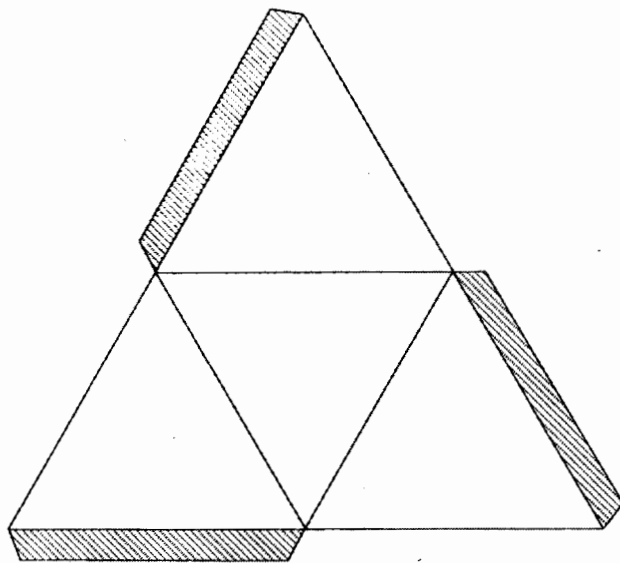


45. The table below shows a bus timetable from town J to town P.

Town	Arrival Time	Departure Time
J		6.25 am
K	8.05 am	8.30 am
L	9.50 am	10.10 am
M	11.25 am	11.40 am
N	1.10 pm	1.40 pm
P	2.20 pm	3.00 pm

What is the distance from town M to town N if the bus travelled at an average speed of 80 km/h?

- A. 120 km
 - B. 140 km
 - C. 160 km
 - D. 180 km
46. The figure below represents the net of a solid.



What solid can be formed from the net?

- A. Rectangular pyramid
- B. Triangular pyramid
- C. Rectangular prism
- D. Triangular prism

Working Space

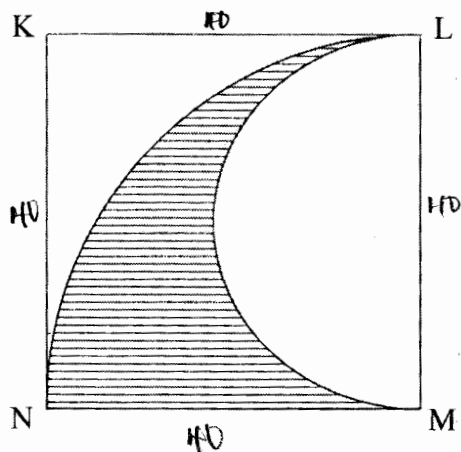


47. The table below shows bus fares to different towns in shillings.

Njiwa					
100	Kasuku				
250	200	Tausi			
450	350	250	Mwewe		
650	500	450	250	Tai	
700	550	500	300	100	Kanga

A man, his wife and their 3 children left Njiwa for Kanga. They stopped at Tausi and then continued with the journey to Kanga in another bus. The buses used the same table and the fare for children is half that of adults. How much did they pay altogether?

- A. sh 3 750
 B. sh 2 625
 C. sh 2 450
 D. sh 1 875
48. The figure KLMN drawn below is a square of sides 40 cm.



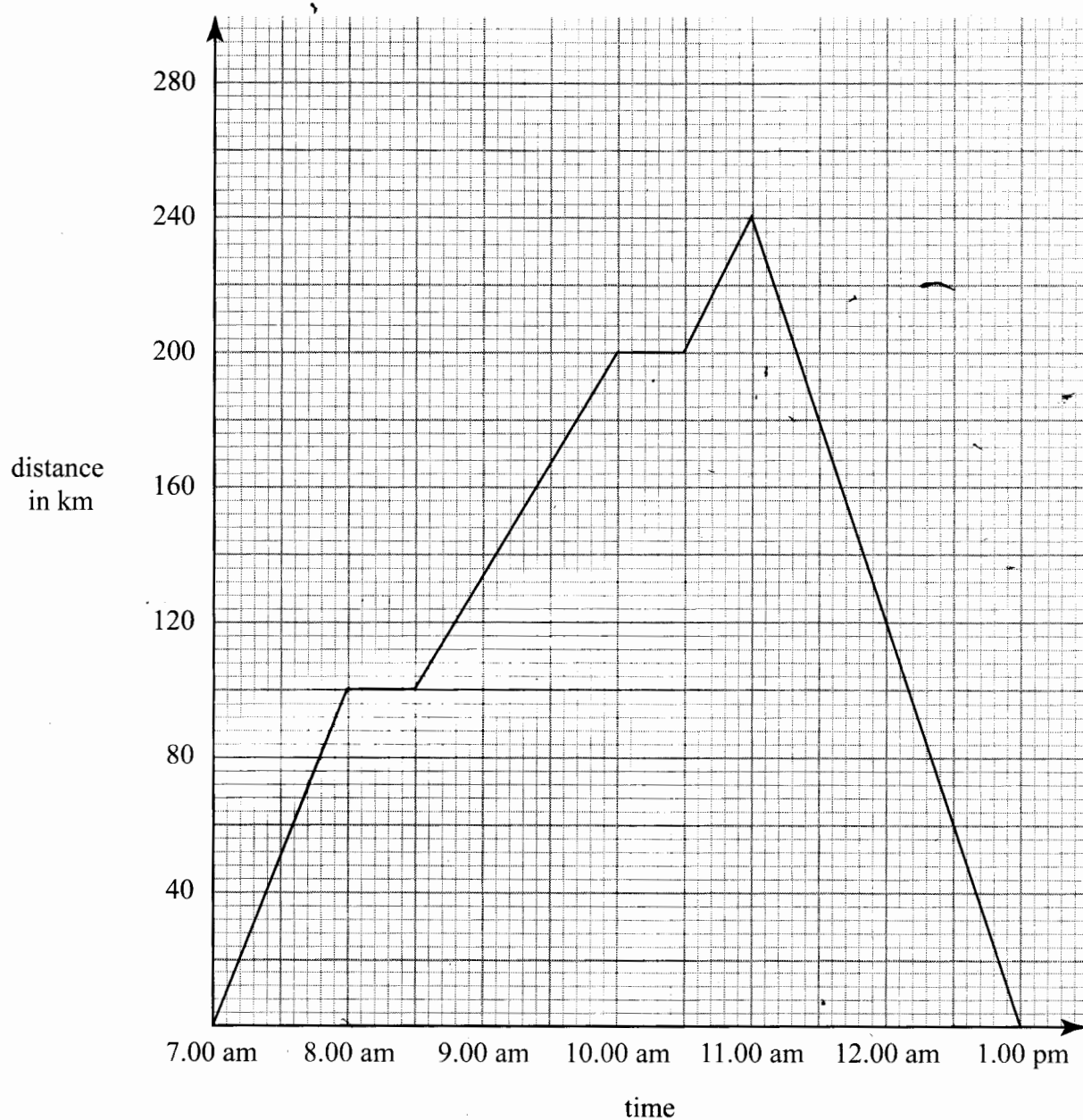
What is the area of the shaded part?
 (Take $\pi = 3.14$).

- A. 1 256 cm²
 B. 972 cm²
 C. 628 cm²
 D. 344 cm²

Working Space



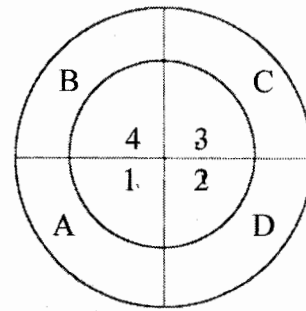
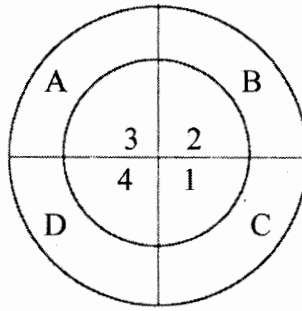
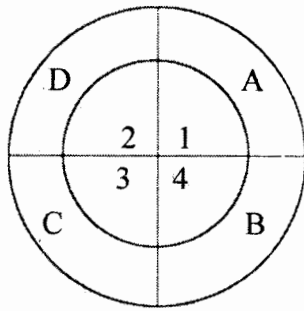
49. The graph shown below represents the journey of a motorist travelling from town Q to town R and back.



- What was the average speed of the car for the whole journey?
- A. 40 km/h
 - B. 80 km/h
 - C. 90 km/h
 - D. 96 km/h

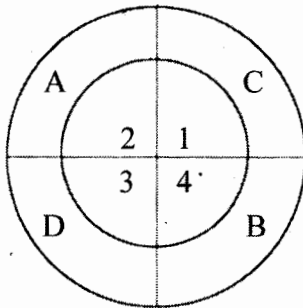


50. The shapes below show a sequence of a pattern.

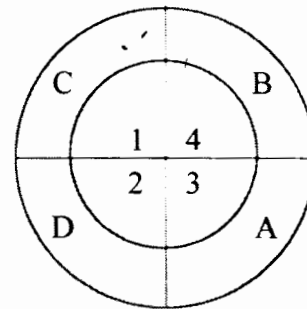


Which one of the following shapes below would be the next in the pattern?

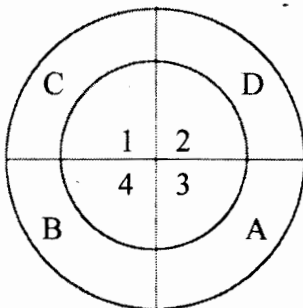
A.



B.



C.



D.

