P4021 Nov.
WASSCE 2013
GENERAL MATHEMATICS/ MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name:.....

Index Number:.....

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination

November 2013 GENERAL MATHEMATICS/MATHEMATICS (CORE) 1 $1\frac{1}{2}$ hours

OBJECTIVE TEST

[50 marks]

Do **not** *open this booklet until you are told to do so. While you are waiting, write your* **name** *and* **index number** *in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
   (a) In the space marked *Name,* write in capital letters your **surname** followed by your **other names.**
   (b) In the spaces marked *Examination, Year, Subject* and *Paper,* write **'WASSCE', '2013 NOV.', 'GENERAL MATHEMATICS/MATHEMATICS (CORE)'** and **'1'**, respectively.
   (c) In the box marked *Index Number,* write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. **Shade** carefully the space with the same number as each digit.
   (d) In the box marked *Paper Code,* write the digits **402112** in the spaces on the left-hand side. **Shade** the corresponding numbered spaces in the same way as for your index number.
   (e) In the box marked *Sex,* shade the space marked **M** if you are **male,** or **F** if you are **female.**
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in **2** above. In the boxes marked *Index Number, Paper Code* and *Sex,* **reshade** each of the shaded spaces.
4. An example is given below. This is for a **male** candidate, whose **name** is **Chukwuma Adekunle CIROMA,** whose **index number** is **5251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: CIROMA (Surname) CHUKWUMA ADEKUNLE (Other Names) Examination: WASSCE Year: 2013 NOV.

Subject: GENERAL MATHEMATICS | MATHEMATICS (CORE) Paper: 1

INDEX NUMBER

	0	1	2	3	4	5	6	7	8	9
5	○	○	○	○	○	●	○	○	○	○
2	○	○	●	○	○	○	○	○	○	○
5	○	○	○	○	○	●	○	○	○	○
1	○	●	○	○	○	○	○	○	○	○
1	○	●	○	○	○	○	○	○	○	○
0	●	○	○	○	○	○	○	○	○	○
2	○	○	●	○	○	○	○	○	○	○
0	●	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	●	○	○	○
8	○	○	○	○	○	○	○	○	●	○

PAPER CODE

	0	1	2	3	4	5	6	7	8	9
4	○	○	○	○	●	○	○	○	○	○
0	●	○	○	○	○	○	○	○	○	○
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2	○	○	●	○	○	○	○	○	○	○

SEX

Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M ■ F □

INSTRUCTIONS TO CANDIDATES

1. Use grade **HB pencil** throughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C] ●
3. Erase completely any answer you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

For Supervisors only.
If candidate is absent shade this space: □

Answer **all** *the questions.*

Mathematical tables may be used in any question.

The use of non-programmable, silent and cordless calculator is allowed.

Each *question is followed by* **four** *options lettered* A *to* D. *Find out the correct option for* **each** *question and shade* **in pencil** *on your answer sheet the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to* **each** *question. An example is given below.*

The ages, in years, of **four** boys are 10, 12, 14, and 18. What is the average age of the boys?

A. 12 years

B. $12\frac{1}{2}$ years

C. 13 years

D. $13\frac{1}{2}$ years

The correct answer is $13\frac{1}{2}$ years, *which is lettered* **D**, *and therefore answer space* D *would be shaded.*

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

Think carefully before you shade the answer spaces; erase completely any answer you wish to change.

Do all rough work on this question paper.

Now, answer the following questions.

1. Simplify: $\frac{2\sqrt{3} - 5\sqrt{2}}{\sqrt{3}}$.

A. $2 - 5\sqrt{2}$

B. $2 + 5\sqrt{2}$

C. $2 - \frac{5}{3}\sqrt{6}$

D. $2 + \frac{5}{3}\sqrt{6}$

2. Express 0.029646 correct to three decimal places.

A. 0.02

B. 0.029

C. 0.03

D. 0.030

3. Simplify, leaving your answer in standard form, $\frac{0.015 \times 0.063}{0.0013}$.

A. 7.269×10^{-2}

B. 7.269×10^{-1}

C. 7.269×10^{1}

D. 7.269×10^{2}

4. If y varies inversely as x and $x = \frac{1}{2}$ when $y = 6$, find y when $x = \frac{1}{3}$.

A. $\frac{1}{36}$

B. 9

C. 12

D. 18

5. Okon won a 200 m race in 25 seconds. If he ran at the same rate, how long in minutes, would it take him to complete 800 m.

A. $2\frac{1}{2}$

B. 2

C. $1\frac{2}{3}$

D. 1

6. A piece of land was offered for N2,100,000.00. If the price was reduced in the ratio 3 : 7, find the new selling price.

A. ₦900,000.00

B. ₦1,100,000.00

C. ₦1,600,000.00

D. ₦1,800,000.00

7. Evaluate: $\frac{\log 27}{\log \frac{1}{3}} + \frac{\log 4}{\log \sqrt{2}}$.

A. –2

B. –1

C. 1

D. 7

8. Expand: $(5x - y)(x - 3y)$.

A. $5x^2 + 16xy + 3y^2$

B. $5x^2 - 16xy + 3y^2$

C. $5x^2 + 14xy - 3y^2$

D. $5x^2 - 14xy + 3y^2$

9. Solve the simultaneous equations: $3x = -y$ and $y = x + 4$.

A. $x = -1$ and $y = 3$.

B. $x = -3$ and $y = -1$.

C. $x = -1$ and $y = -3$.

D. $x = 3$ and $y = 1$.

10. Factorize: $p - bq + q - bp$.

A. $(p - q)(1 - b)$

B. $(p + q)(b - 1)$

C. $(p + q)(1 - b)$

D. $(p + q)(1 + b)$

11. If $m = 2$, $n = -3$ and $p = -2$, evaluate: $\frac{mn^2 - p^2}{2np} + \frac{m^2}{2n + p}$.

A. $\frac{1}{3}$

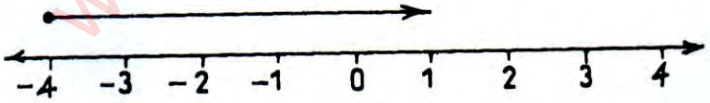
B. $\frac{2}{3}$

C. $\frac{4}{5}$

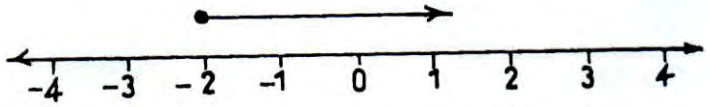
D. $1\frac{2}{3}$

12. Which of the following number lines **correctly** represents the solution of $4(x + 1) \leq 5(x - 2) + 16$?

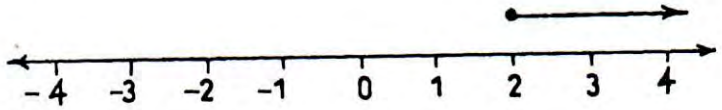
A.



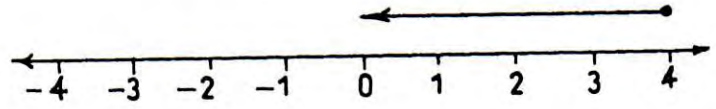
B.



C.



D.



13. Find the equation whose roots are $\frac{1}{2}$ and $\frac{-2}{3}$.

A. $6x^2 - x + 2 = 0$

B. $6x^2 - x - 2 = 0$

C. $6x^2 + x + 2 = 0$

D. $6x^2 + x - 2 = 0$

14. Make m the subject of the equation $y = mx + c$.

A. $m = \frac{y - x}{c}$.

B. $m = \frac{y - c}{x}$.

C. $m = x(y - c)$.

D. $m = x(y + c)$.

15. If $\frac{2(x-1)}{3} - \frac{3(2x-1)}{4} = \frac{1}{2}$, find x.

A. $-\frac{1}{2}$

B. $-\frac{3}{5}$

C. -2

D. $-\frac{23}{10}$

16. A cylinder of height 7 *cm* has a curved surface area of 264 cm^2. Find the radius of its base.

[Take $\pi = \frac{22}{7}$]

A. 6 *cm*

B. 10 *cm*

C. 15 *cm*

D. 16 *cm*

17. PQR is a triangle such that $|PQ| = 12$ *cm* and $\angle PQR = 50.1°$, calculate the length of the perpendicular from P to QR.

A. 7·70 *cm*

B. 9.21 *cm*

C. 10.62 *cm*

D. 14·35 *cm*

18. Calculate, correct to the nearest whole number, the total surface area of a solid cone whose slant height 18 *cm* and base diameter 34 *cm*.

[Take $\pi = \frac{22}{7}$]

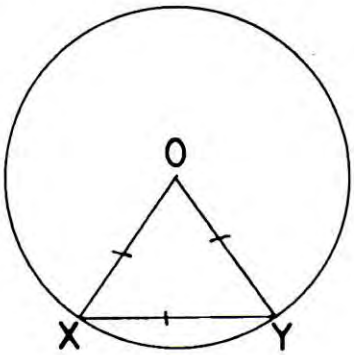
A. 1780 cm^2

B. 1808 cm^2

C. 1870 cm^2

D. 1970 cm^2

19.



In the figure, O is the centre of the circle and $|OY| = |XY| = 7$ cm. If triangle OXY is cut out from the circl calculate correct to 3 significant figures, the area of the remaining portion.

[Take $\pi = \frac{22}{7}$]

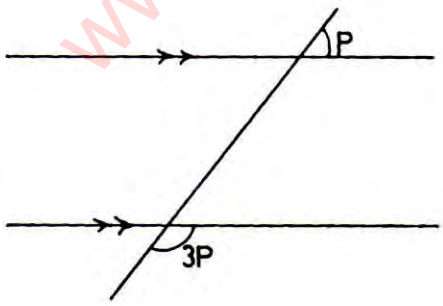
A. 133 cm^2

B. 128 cm^2

C. 25·7 cm^2

D. 22·8 cm^2

20.



Find the value of P in the diagram.

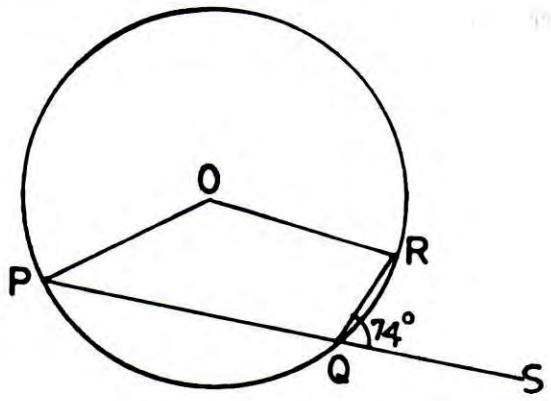
A. 60°

B. 45°

C. 30°

D. 15°

21.



In the diagram, $\angle RQS = 74°$. Find the reflex angle POR.

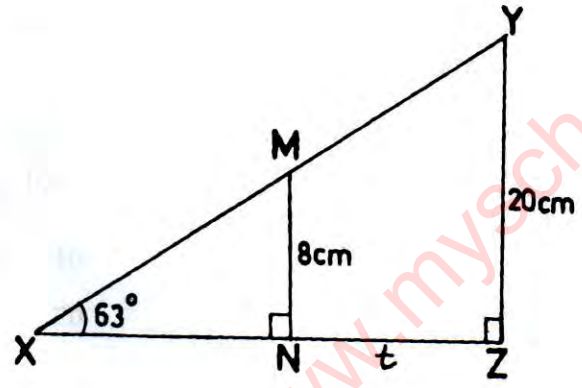
A. 200°

B. 212°

C. 228°

D. 240°

22.



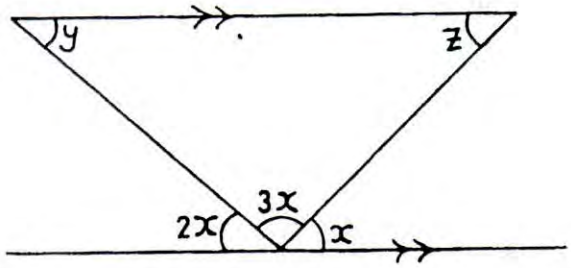
In the diagram, triangle XMN and XYZ are similar triangles, $|YZ| = 20\ cm$, $|MN| = 8$ cm, $\angle MXN = 63°$ and $|NZ| = t$. Find the value of t.

A. 4.1 *cm*

B. 6.1 *cm*

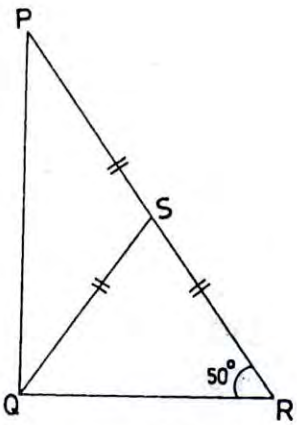
C. 7.1 *cm*

D. 10.1 *cm*

23. 

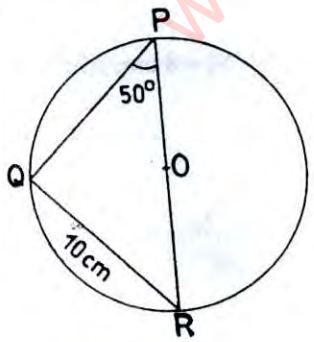
Find the value of y in the diagram.

A. 30°
B. 45°
C. 60°
D. 90°

24. 

In the diagram, $|PS| = |SQ| = |SR|$ and $\angle QRS = 50^\circ$. Calculate the size of $\angle QPS$.

A. 60°
B. 50°
C. 40°
D. 30°

25. 

In the diagram, O is the centre of the circle, $\angle QPR = 50^\circ$ and $|QR| = 10\ cm$. Calculate, correct to one decimal place, the radius of the circle.

A. 15.6 *cm*
B. 13.0 *cm*
C. 7.8 *cm*
D. 6.5 *cm*

26. Given that Cos $2x$ – Sin $x = 0$ and $0° \leq x \leq 90°$, find the value of x.

A. 90°
B. 60°
C. 45°
D. 30°

27. Town X is 6 *km* away and on a bearing of 030° from Y. Town Z is 8 *km* from Town X and on a bearing of 120°. Calculate, correct to the nearest whole number, the bearing of Z from Y.

A. 067°
B. 071°
C. 079°
D. 083°

28. If the mean of 13, 15, x and 18 is 19, find the median.

A. 15.0
B. 15.5
C. 16.5
D. 18.0

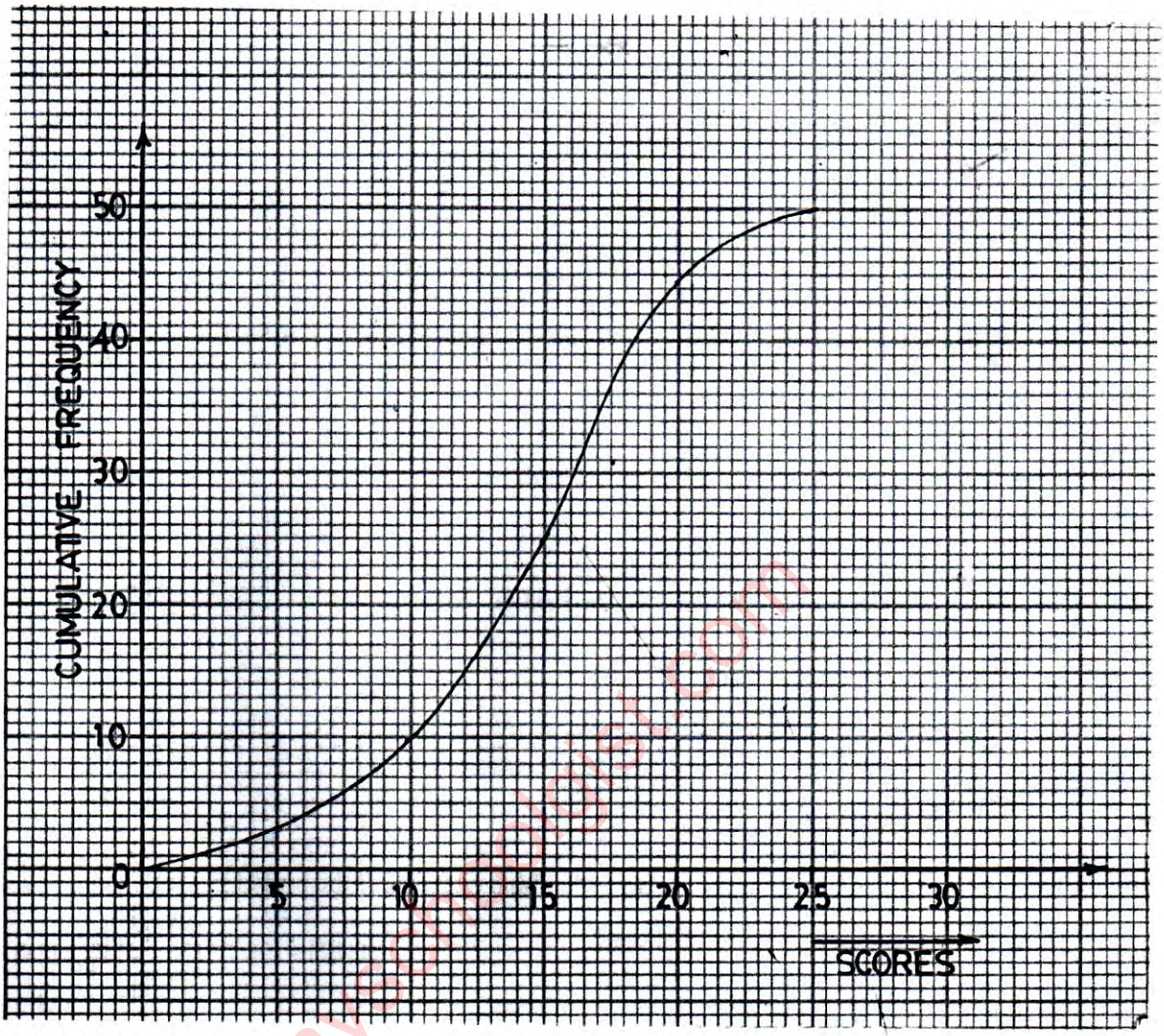
29. A box contains 40 identical beads that are either blue or green. If the probability of picking a blue bead is $\frac{1}{4}$, how many green beads were in the box?

A. 10
B. 20
C. 30
D. 40

30. For what values of x is the expression $\frac{x^2 - 9}{x^2 - 3x + 2}$ **not** defined?

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

31.



Use the cummulative frequency curve to answer questions **31** *and* **32**.

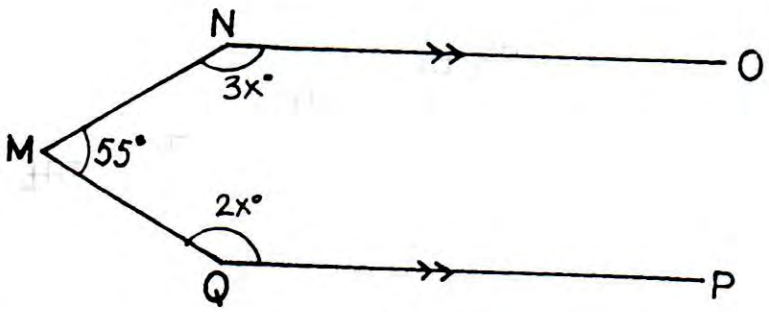
31. Find the 80th percentile of the distribution.

A. 18.0
B. 18.3
C. 19.0
D. 19.3

32. Find the interquartile range of the distribution.

A. 19·6
B. 15·2
C. 13·7
D. 6·5

33.



In the diagram, $\angle MNO = 3x$, $\angle MQP = 2x$ and $\angle NMQ = 55°$. Find the value of x.

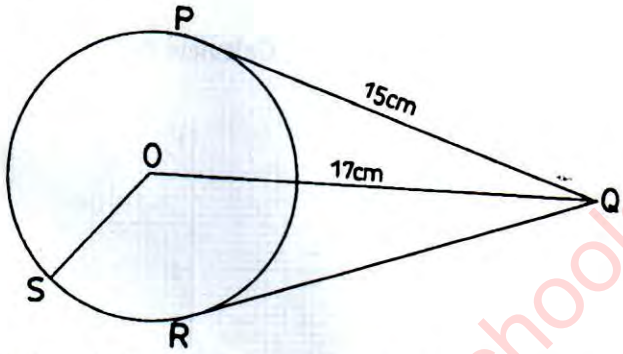
A. 125°

B. 67°

C. 61°

D. 51°

34.



$\overline{PQ}$ and $\overline{RQ}$ are tangents to circle PRS with centre O. If $|PQ| = 15\ cm$ and $|OQ| = 17\ cm$, find $|RQ| + |SO|$.

A. 20 *cm*

B. 22 *cm*

C. 23 *cm*

D. 24 *cm*

35. If $\frac{1}{3}(81^n) = 81^2$, find n.

A. 3

B. $\frac{9}{4}$

C. 2

D. $\frac{4}{3}$

36. A side of a regular polygon is 10 *cm*. If **each** of its interior angles is 156°, calculate its perimeter.

A. 100 *cm*

B. 120 *cm*

C. 150 *cm*

D. 240 *cm*

37. Solve the equation: $x^2 - 4\sqrt{5}x + 20 = 0$.

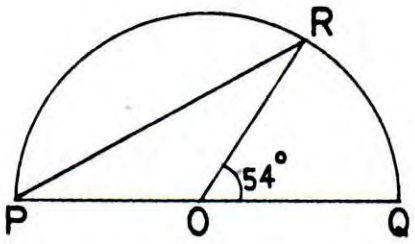
A. $x = 2\sqrt{5}$ or $-2\sqrt{5}$

B. $x = 4\sqrt{5}$ or $-4\sqrt{5}$

C. $x = 2\sqrt{5}$ or $2\sqrt{5}$

D. $x = 4\sqrt{5}$ or $4\sqrt{5}$

38.



In the diagram, O is the centre of the semi-circle PRQ and $\angle ROQ = 54°$. Calculate the value of $\angle PRO$.

A. 36°

B. 32°

C. 30°

D. 27°

39. An obtuse angle is **four** times the size of its supplementary angle. Find the value of the supplementary angle.

A. 45°

B. 36°

C. 30°

D. 18°

40. The volume of a cylinder with diameter 14 cm is 770 cm^3. What is the curved surface area of the cylinder?

[Take $\pi = \frac{22}{7}$]

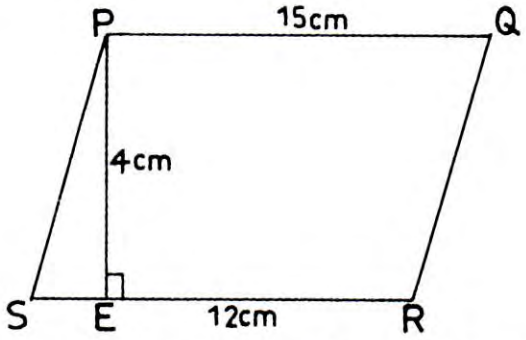
A. 528 cm^2

B. 374 cm^2

C. 308 cm^2

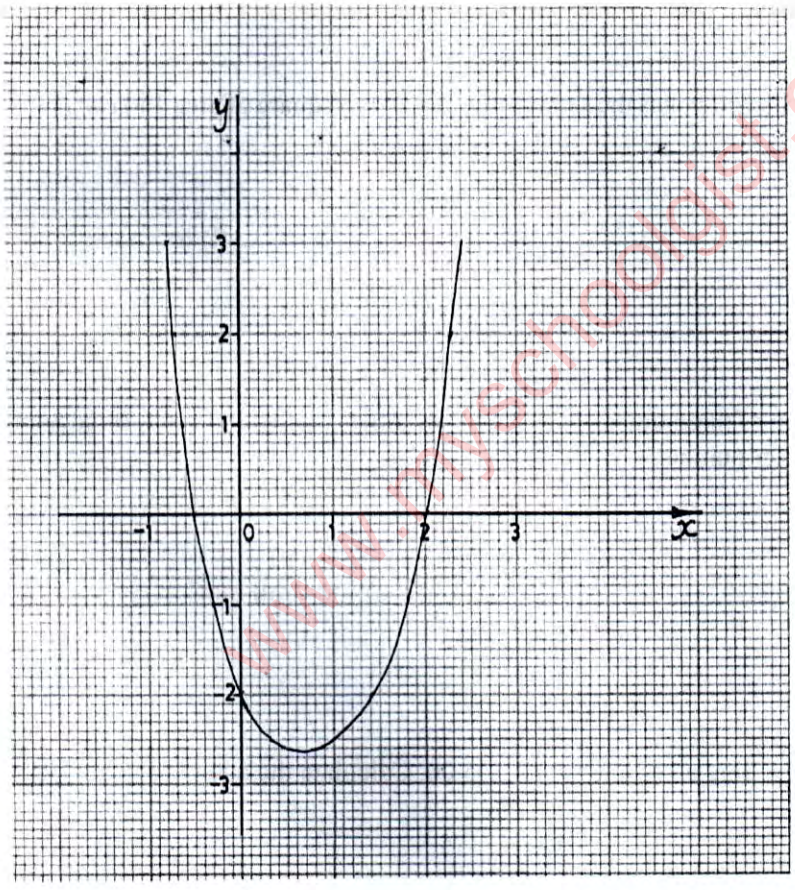
D. 220 cm^2

41.



In the figure, $PQRS$ is a parallelogram, $|PQ| = 15\ cm$, $|ER| = 12\ cm$ and $|PE| = 4$ cm. Find the perimeter of the parallelogram.

A. 50 *cm*
B. 45 *cm*
C. 44 *cm*
D. 40 *cm*



The graph is for the equation $y = ax^2 + bx + c$. *Use it to answer questions* **42** *and* **43**.

42. What is the **minimum** value of y?

A. –2.45
B. –2.55
C. –2.65
D. –2.75

43. Find the value of y when $x = \frac{1}{2}$.

A. 0·0

B. –1.5

C. –2.0

D. –2.6

44. A petrol tanker is $\frac{2}{5}$ full. When 35,000 litres of petrol are added, the tanker will be $\frac{3}{4}$ full. What is the capacity of the tanker in litres?

A. 70,000

B. 75,000

C. 90,000

D. 100,000

45. A rectangle whose length is twice its width, has the same perimeter with a square of area 144 cm^2. Find the length of the rectangle.

A. 10 *cm*

B. 12 *cm*

C. 16 *cm*

D. 24 *cm*

46. Two numbers are such that the sum of three times the first and two times the second is 68. If the numbers are in the ratio 3 : 4, find the smaller number.

A. 10

B. 12

C. 14

D. 16

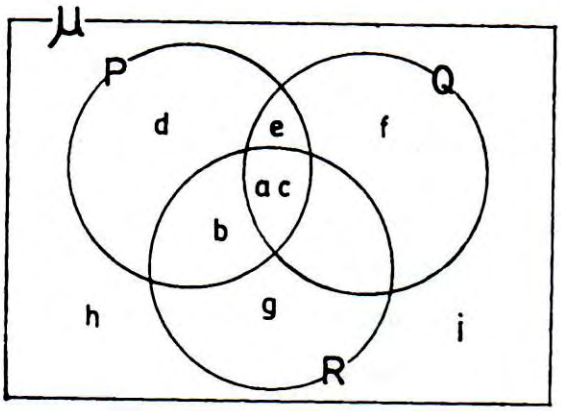
47. A trader made a profit of 15% by selling an article for *Le* 345.00. Calculate the actual profit.

A. *Le* 300.00

B. *Le* 117.00

C. *Le* 51.75

D. *Le* 45.00



Use the Venn diagram to answer questions **48** *and* **49**.

48. Find $n(P' \cap R' \cup Q)$.

A. 6

B. 5

C. 4

D. 3

49. List the elements of $(P \cup Q)' \cap R'$.

A. $\{g, h, i\}$

B. $\{h, i,\}$

C. $\{g\}$

D. $\{\ \}$

50. A letter is selected from the word *EXAMINATIONS*. What is the probability that the letter selected is *N*?

A. $\frac{1}{12}$

B. $\frac{1}{10}$

C. $\frac{1}{9}$

D. $\frac{1}{6}$