P4021 Nov.
WASSCE 2011
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 2011 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', '2011 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: 2011 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	○	○	○	○	○	○	○	○	●	○

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

PAPER CODE

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

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. A money lender collects \$200 simple interest on a capital after 2 years at 5%. Calculate the capital invested.

A. \$1,000.00

B. \$2,000.00

C. \$3,000.00

D. \$4,000.00

2. Simplify: $\log_{10}2{\cdot}25 + 4\log_{10}2 - 2\log_{10}0{\cdot}6$.

A. 1

B. 2

C. 3

D. 4

3. Simplify: $5\sqrt{12} - 4\sqrt{75} + 3\sqrt{48}$.

A. $3\sqrt{3}$

B. $2\sqrt{3}$

C. $-2\sqrt{3}$

D. $-3\sqrt{3}$

4. A book seller gives 5% discount to a customer who pays cash. What is the marked price of a book for which the customer pays ₦475.00?

A. ₦300.00

B. ₦400.00

C. ₦500.00

D. ₦600.00

5. If y varies inversely as the cube root of x and $y = 4$ when $x = 27$, find y when $x = 8$.

A. 6

B. 4

C. 3

D. 2

6. The *nth* term of a sequence is $2^{2n}\left(-\frac{1}{2}\right)^n$. Find the third term.

A. –512

B. –64

C. –32

D. –8

7. If $y\%$ of a number n equals k, what is 3% of n?

A. $\frac{k}{3y}$

B. $\frac{3k}{y}$

C. $\frac{k}{300y}$

D. $\frac{3k}{100y}$

14. If $x + 2y = 7$ and $4x + 11y = 34$, by how much is $3y$ less than 10?

A. 3

B. 4

C. 5

D. 7

15. Solve the equation: $7x^2 - 3x - 10 = 0$.

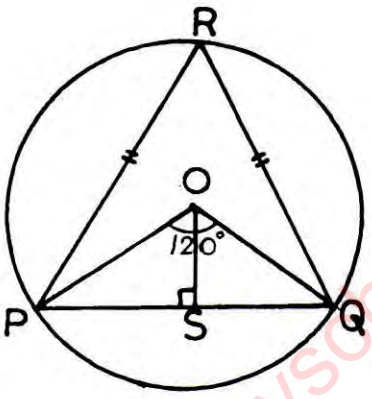
A. $-1, \frac{10}{7}$

B. $1, -\frac{10}{7}$

C. $-1, -\frac{10}{7}$

D. $1, \frac{10}{7}$

16.



In the diagram, P, Q and R are points on a circle with centre O. The chord $|PQ| = 10\sqrt{3}$ *cm*, $\angle OSQ = 90°$ and $P\hat{O}Q = 120°$. Find $|RS|$.

A. 15 *cm*

B. $15\sqrt{3}$ *cm*

C. 25 *cm*

D. $25\sqrt{3}$ *cm*

17. A rectangular tank 82 *cm* long, 37 *cm* wide and 75 *cm* deep has the same volume as a cylinderical tank. If the radius of the cylinderical tank is 30 *cm*, calculate its height.

[Take $\pi = 3{\cdot}14$]

A. 83·00 *cm*

B. 80·52 *cm*

C. 52·80 *cm*

D. 50·80 *cm*

18. A chord PR of a circle, centre O, is 20 cm long. If $P\hat{O}R = 120°$, calculate the radius of the circle.

A. 16·0 cm

B. 13·0 cm

C. 11·5 cm

D. 11·2 cm

19. PQ is the diameter of a circle PQR. $|PR| = 9$ cm and $|RQ| = 12$ cm. Calculate the area of the circle.

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

A. 88·4 cm^2

B. 144·0 cm^2

C. 176·8 cm^2

D. 225·0 cm^2

20. In an octagon, three of the interior angles are $x°$ each. Each of the remaining five interior angles is $(16 + x)°$. Find the value of x.

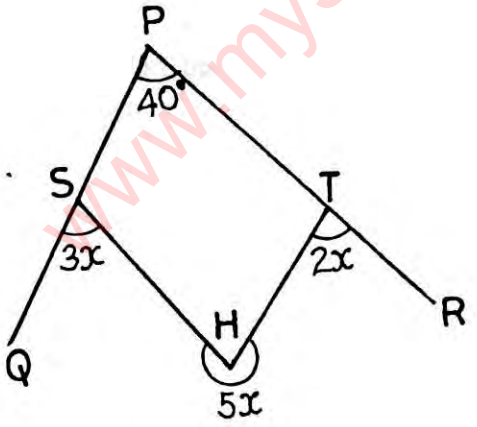
A. 102°

B. 105°

C. 120°

D. 125°

21.



In the diagram, PSQ and PTR are straight lines, reflex $\angle SHT = 5x$, $\angle HTR = 2x$ and $\angle QSH = 3x$.

Find the value of x.

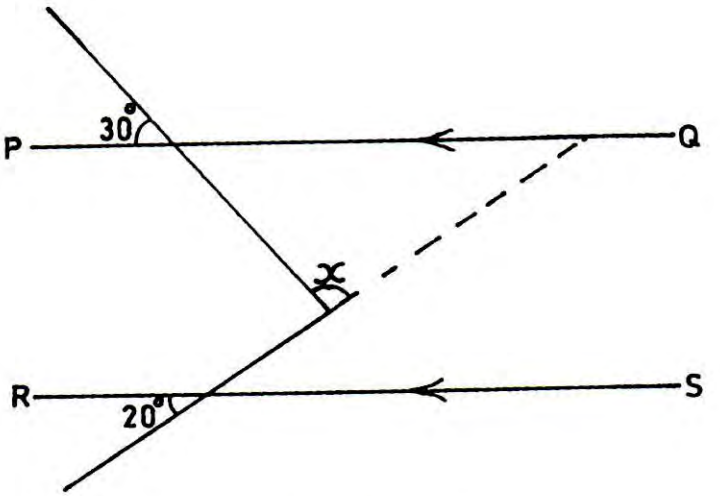
A. 32°

B. 40°

C. 68°

D. 70°

22.



In the figure, $\overline{PQ}//\overline{RS}$. Find the value of the angle marked x.

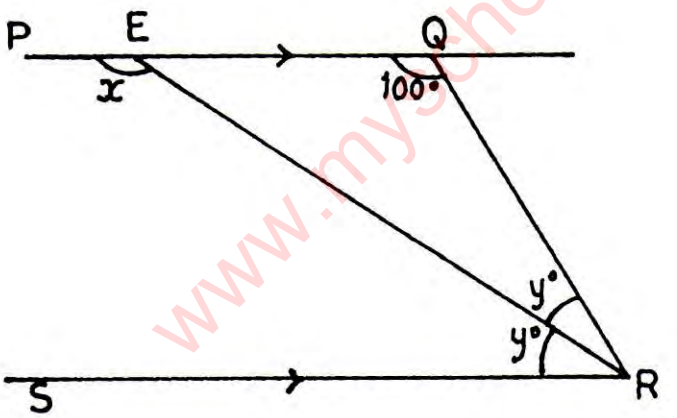
A. 90°

B. 120°

C. 125°

D. 130°

23.



In the diagram, $\overline{PQ}$ is parallel to $\overline{SR}$, $\angle EQR = 100°$ and $\overline{ER}$ bisects $\angle QRS$. Find the value of x.

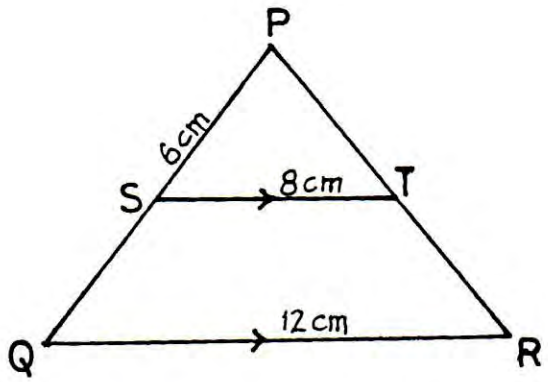
A. 120°

B. 130°

C. 140°

D. 150°

24.



In the diagram, $\overline{ST}//\overline{QR}$, $|PS| = 6\ cm$, $|ST| = 8\ cm$ and $|QR| = 12\ cm$. Calculate $|SQ|$.

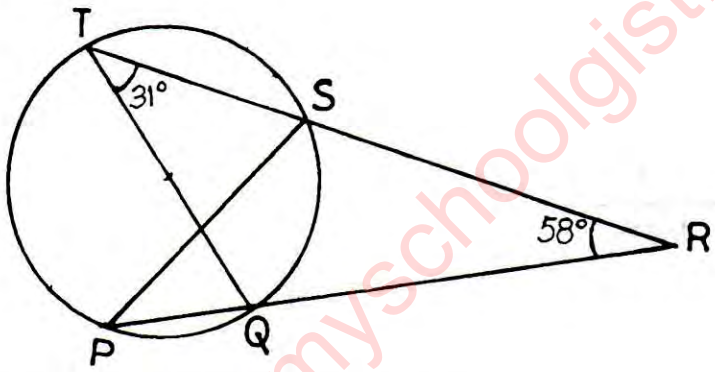
A. $6\ cm$

B. $5\ cm$

C. $4\ cm$

D. $3\ cm$

25.



Find the value of $\angle TSP$ in the diagram.

A. 91°

B. 89°

C. 71°

D. 69°

26. The bearing of P from Q is $N5°\ W$. Find the true bearing of Q from P.

A. 100°

B. 175°

C. 180°

D. 185°

27. If $\cos p = 0{\cdot}8$, evaluate $20 \tan p \sin p$.

A. 6

B. 9

C. 12

D. 18

28. A ladder 5 *m* long leans against a vertical wall. The foot of the ladder is 3 *m* from the wall on the same horizontal ground. Calculate, correct to the nearest degree, the angle which the ladder makes with the wall.

A. 35°

B. 37°

C. 38°

D. 39°

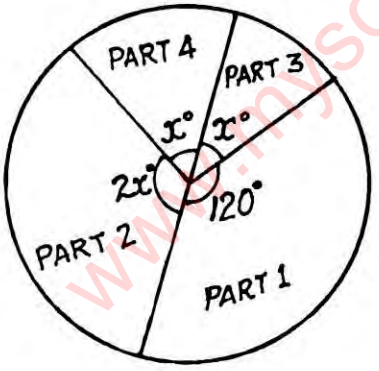
29. What is the probability that an event E will surely occur?

A. $\Pr(E) = 1$

B. $\Pr(E) \neq 0$

C. $\Pr(E) < 1$

D. $\Pr(E) > 0$



The pie chart represents the distribution of 900 undergraduates in a university. Use the information to answer questions **30** *and* **31**.

30. Calculate the value of x.

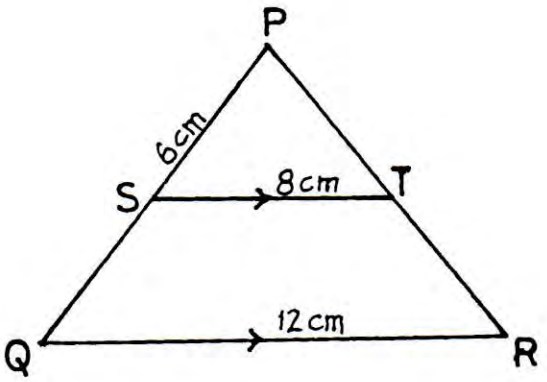
A. 36°

B. 60°

C. 72°

D. 108°

24.



In the diagram, $\overline{ST}//\overline{QR}$, $|PS| = 6\ cm$, $|ST| = 8\ cm$ and $|QR| = 12\ cm$. Calculate $|SQ|$.

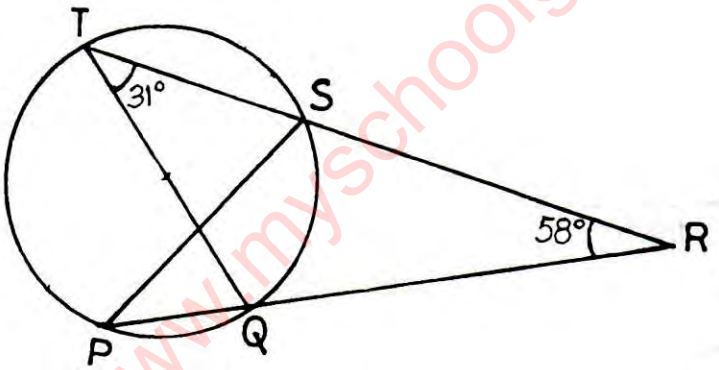
A. 6 *cm*

B. 5 *cm*

C. 4 *cm*

D. 3 *cm*

25.



Find the value of $\angle TSP$ in the diagram.

A. 91°

B. 89°

C. 71°

D. 69°

26. The bearing of P from Q is $N5°\ W$. Find the true bearing of Q from P.

A. 100°

B. 175°

C. 180°

D. 185°

31. How many undergraduates are in Part 3?

A. 100

B. 120

C. 150

D. 180

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

A. 15·0

B. 15·5

C. 16·5

D. 18·0

33. Aku, Kay and Badu share an amount in the ratio 2:5:9 respectively. If Badu receives GH¢48.00 more than Kay, find the amount shared.

A. GH¢92.00

B. GH¢126.67

C. GH¢153.60

D. GH¢192.00

34. Simplify: $6\frac{1}{3} - 2\frac{3}{4} + 1\frac{1}{6}$.

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

B. $4\frac{1}{5}$

C. $2\frac{1}{4}$

D. $\frac{11}{30}$

35. Simplify: $\left[\frac{3}{x} - \frac{15}{2y}\right] \div \frac{6}{xy}$.

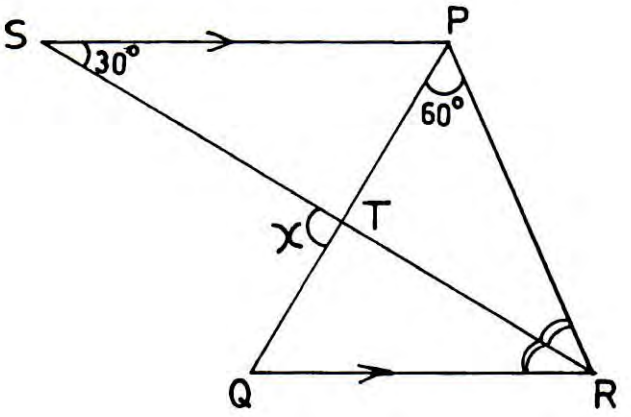
A. $\frac{2y - 5x}{4}$

B. $\frac{3(2y - 5x)}{2x^2y^2}$

C. $\frac{5x - 2y}{4}$

D. $\frac{x^2y^2}{18y - 45x}$

36.



In the figure, $PS//QR$. SR bisects angle PRQ. If $\angle PST = 30°$ and $\angle RPQ = 60°$, calculate angle x.

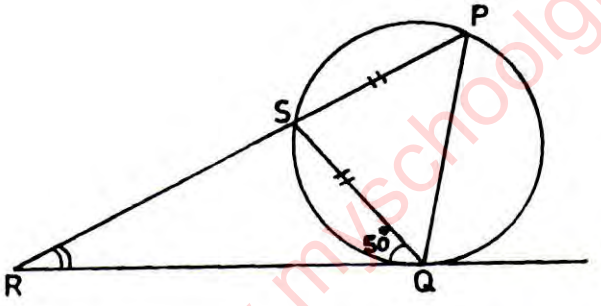
A. 105°

B. 100°

C. 95°

D. 90°

37.



In the diagram, $\overline{RQ}$ is a tangent to the circle, $|PS| = |SQ|$ and $\angle SQR = 50°$. Calculate $\angle SRQ$.

A. 30°

B. 35°

C. 40°

D. 45°

38. Two students are selected at random from 5 boys and 4 girls. Find the probability that both are boys.

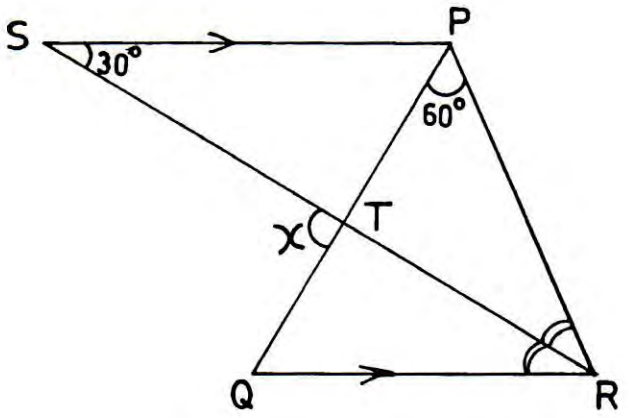
A. $\frac{5}{18}$

B. $\frac{2}{9}$

C. $\frac{5}{9}$

D. $\frac{20}{81}$

36.



In the figure, $PS//QR$. SR bisects angle PRQ. If $\angle PST = 30°$ and $\angle RPQ = 60°$, calculate angle x.

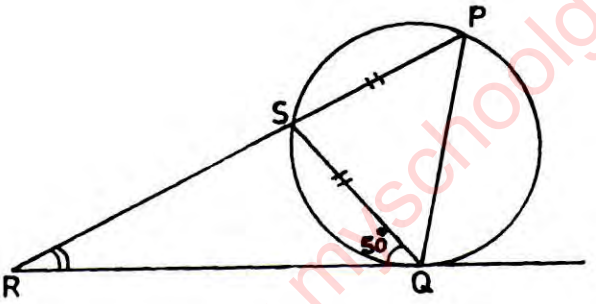
A. 105°

B. 100°

C. 95°

D. 90°

37.



In the diagram, $\overline{RQ}$ is a tangent to the circle, $|PS| = |SQ|$ and $\angle SQR = 50°$. Calculate $\angle SRQ$.

A. 30°

B. 35°

C. 40°

D. 45°

38. Two students are selected at random from 5 boys and 4 girls. Find the probability that both are boys.

A. $\frac{5}{18}$

B. $\frac{2}{9}$

C. $\frac{5}{9}$

D. $\frac{20}{81}$

39. Calculate the perimeter of a quadrant of a circle, radius 10·5 *cm*.

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

A. 37·5 *cm*

B. 36·0 *cm*

C. 32·5 *cm*

D. 27·0 *cm*

40. P and Q are two intersecting subsets of a universal set E. If $n(P) = 25$, $n(Q) = 20$, $n(P \cup Q)' = 5$ and $n(E) = 40$, find $n(P \cap Q)$.

A. 5

B. 10

C. 15

D. 20

41. The perpendicular height of a pyramid is 12 *m*. If its base is a square of side 5 *m*, calculate its volume.

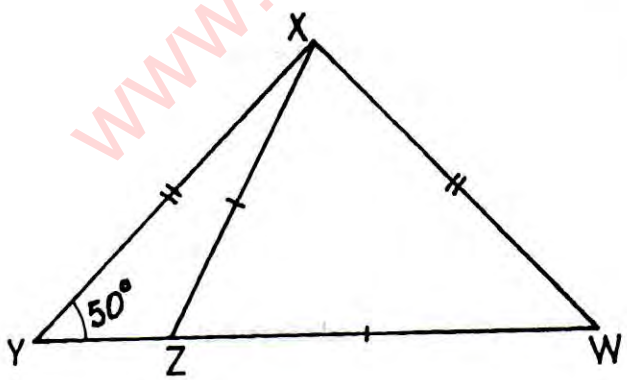
A. 200 m^3

B. 100 m^3

C. 80 m^3

D. 60 m^3

42.



In the diagram, WXY is a triangle. $|XY| = |XW|$, $|XZ| = |WZ|$ and $\angle XYZ = 50°$. Find $\angle XZW$.

A. 55°

B. 65°

C. 70°

D. 80°

43. Express the sum of 10^{-2} and 10^{-3} in standard form.

A. $1{\cdot}0 \times 10^{-6}$

B. $1{\cdot}0 \times 10^{-4}$

C. $1{\cdot}1 \times 10^{-3}$

D. $1{\cdot}1 \times 10^{-2}$

44. Given that $r = \frac{xy}{2}$ and $x = \frac{v}{w}$, express r in terms of y, v and w.

A. $\frac{2vw}{y}$

B. $\frac{vw}{2y}$

C. $\frac{vwy}{2}$

D. $\frac{vy}{2w}$

45. Calculate the length of the diagonal of a square whose area is $p\ cm^2$.

A. $\sqrt{p}$

B. $2\sqrt{p}$

C. $p\sqrt{2}$

D. $\sqrt{2p}$

46. If $2p^2 = \frac{1}{2}$ and $pq = 2$, find the values of q.

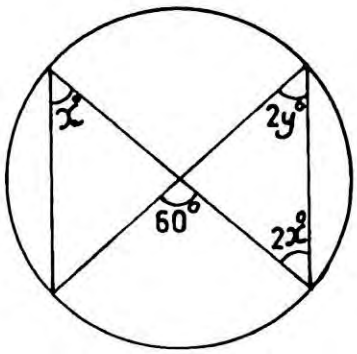
A. $-4, 4$

B. $-2, 2$

C. $2, 2$

D. $4, 4$

47.



Find the value of y in the diagram.

A. 10

B. 15

C. 20

D. 30

48. Convert 2201_{four} to a base ten numeral.

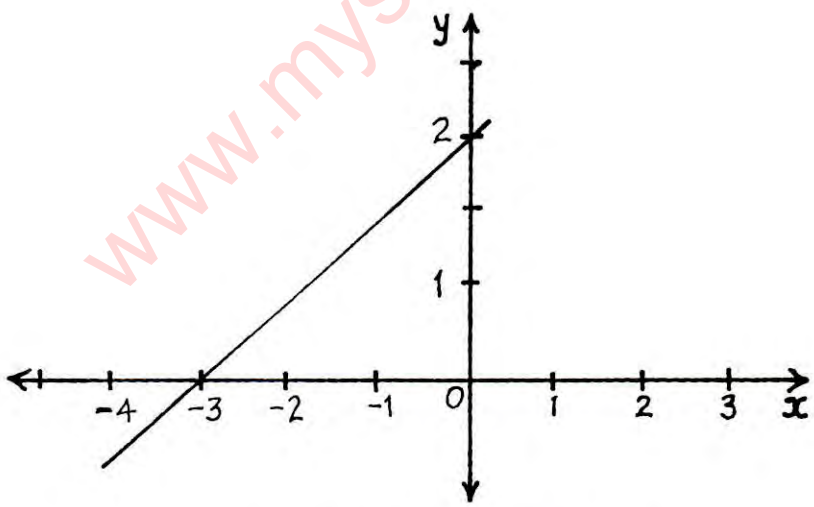
A. 128

B. 137

C. 161

D. 165

49.



Which of the following equations satisfies the linear graph above?

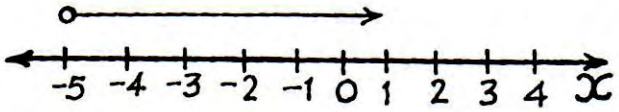
A. $3y = 2x - 6$

B. $2y = -3x + 6$

C. $3y = 2x + 6$

D. $2y = 3x - 6$

50.



Which of the following inequalities is represented by the number line?

A. $x \geq -5$

B. $x > -5$

C. $x < -5$

D. $x \leq -5$