

P4021 Nov.
WASSCE 2011
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
1½ hours

1

Name:

Index Number:

THE WEST AFRICAN EXAMINATIONS COUNCIL
West African Senior School Certificate Examination

November 2011

GENERAL MATHEMATICS/MATHEMATICS (CORE) 1

1½ 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.

- Use HB pencil throughout.
- If you have got a blank answer sheet, complete its top section as follows.
 - In the space marked *Name*, write in capital letters your **surname** followed by your **other names**.
 - In the spaces marked *Examination*, *Year*, *Subject* and *Paper*, write 'WASSCE', '2011 NOV.', 'GENERAL MATHEMATICS/MATHEMATICS (CORE)' and '1', respectively.
 - 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.
 - 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.
 - In the box marked *Sex*, shade the space marked **M** if you are **male**, or **F** if you are **female**.
- 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.
- 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 CHUKWUMA ADEKUNLE Examination: WASSCE Year: 2011 NOV.
Surname Other Names

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

INDEX NUMBER	
5	0 1 2 3 4 5 6 7 8 9
2	0 1 2 3 4 5 6 7 8 9
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PAPER CODE	
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SEX
Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M F
<input type="checkbox"/> <input type="checkbox"/>

INSTRUCTIONS TO CANDIDATES

- Use grade HB pencil throughout.
- Answer each question by choosing one letter and shading it like this: [A] [B] [C]
- Erase completely any answers you wish to change.
- Leave extra spaces blank if the answer spaces provided are more than you need.
- 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. 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: $\log_{10}2 \cdot 25 + 4\log_{10}2 - 2\log_{10}0.6$.
 - 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 n th 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. $\frac{3k}{100y}$

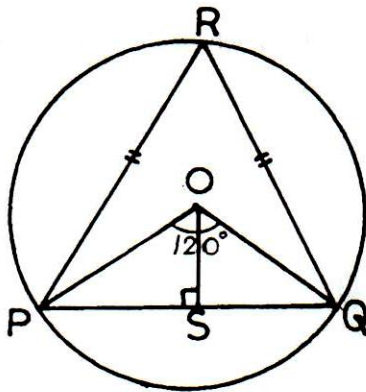
14. If $x + 2y = 7$ and $4x + 11y = 34$, by how much is $3y$ less than 10?

- 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, $\angle OSQ = 90^\circ$ and $\angle POQ = 120^\circ$. Find $|RS|$.

- A. 15 cm
- B. $15\sqrt{3}$ cm
- C. 25 cm
- D. $25\sqrt{3}$ cm

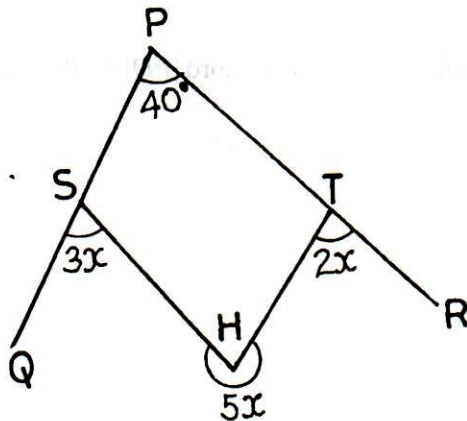
17. A rectangular tank 82 cm long, 37 cm wide and 75 cm deep has the same volume as a cylindrical tank. If the radius of the cylindrical tank is 30 cm, calculate its height.

[Take $\pi = 3.14$]

- 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 $\widehat{POR} = 120^\circ$, 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 . $|PR| = 9\text{ cm}$ and $|RQ| = 12\text{ cm}$. 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 $(16 + x)^\circ$. Find the value of x .
- A. 102°
 B. 105°
 C. 120°
 D. 125°

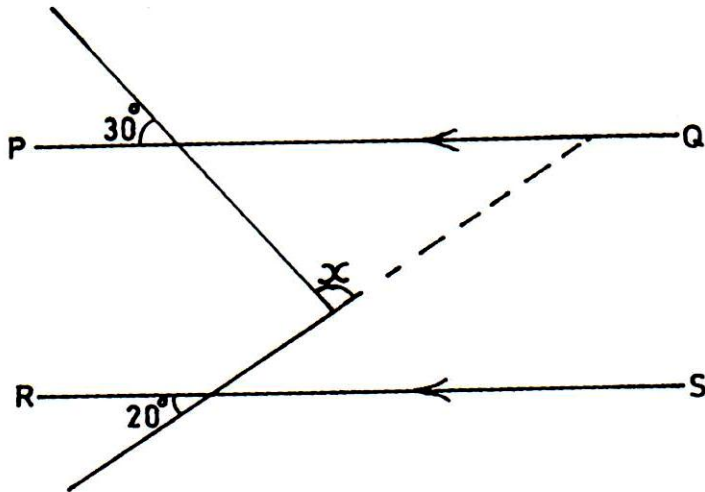
21.



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°

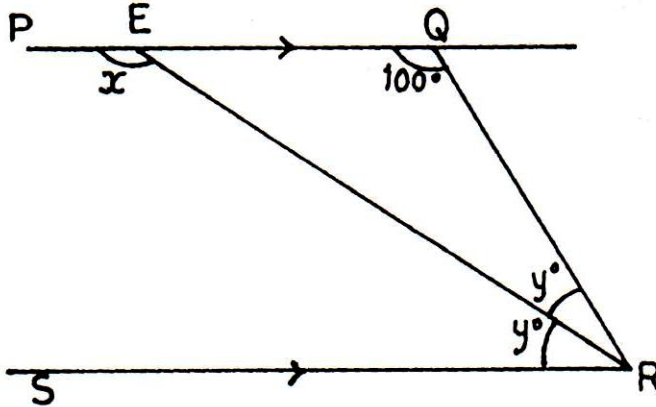
22.



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

- A. 90°
- B. 120°
- C. 125°
- D. 130°

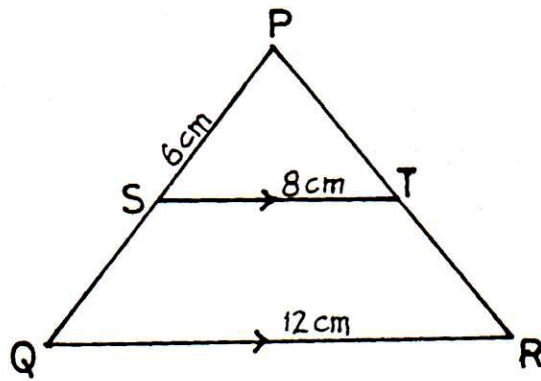
23.



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

- A. 120°
- B. 130°
- C. 140°
- D. 150°

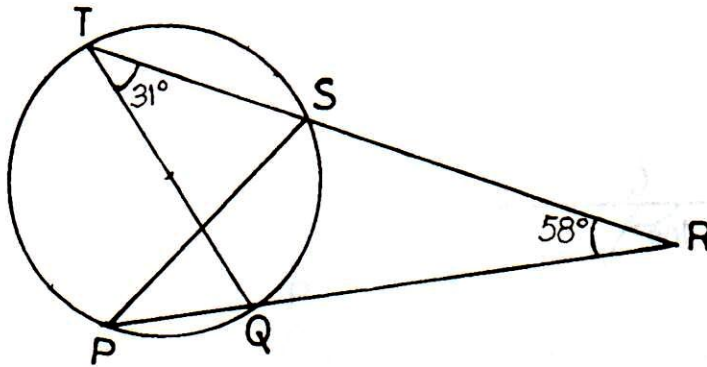
24.



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

- A. 6 cm
- B. 5 cm
- C. 4 cm
- D. 3 cm

25.



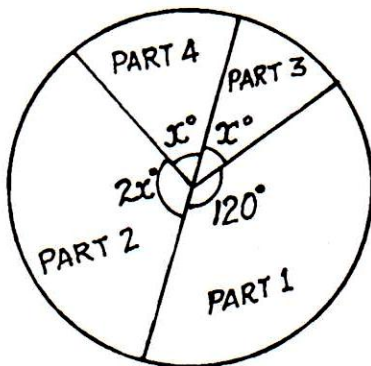
Find the value of $\angle TSP$ in the diagram.

- A. 91°
- B. 89°
- C. 71°
- D. 69°

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

- A. 100°
- B. 175°
- C. 180°
- D. 185°

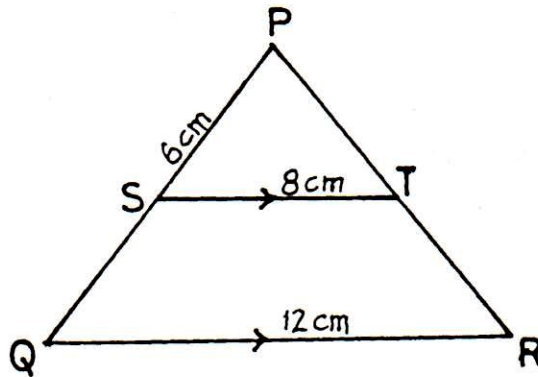
27. If $\cos p = 0.8$, evaluate $20 \tan p \sin p$.
- A. 6
B. 9
C. 12
D. 18
28. A ladder 5 m long leans against a vertical wall. The foot of the ladder is 3 m from the wall on the same horizontal ground. Calculate, correct to the nearest degree, the angle which the ladder makes with the wall.
- A. 35°
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°

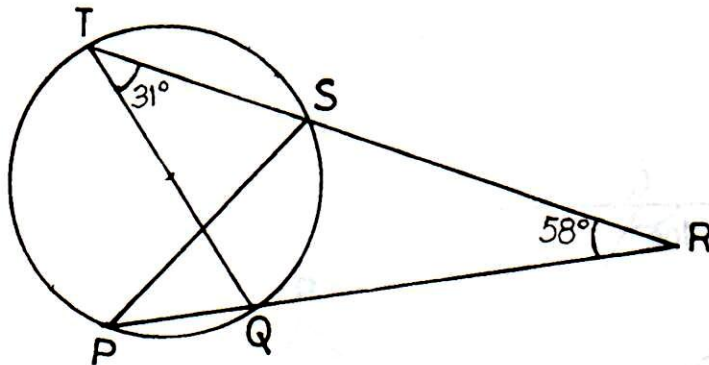
24.



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

- A. 6 cm
- B. 5 cm
- C. 4 cm
- D. 3 cm

25.



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

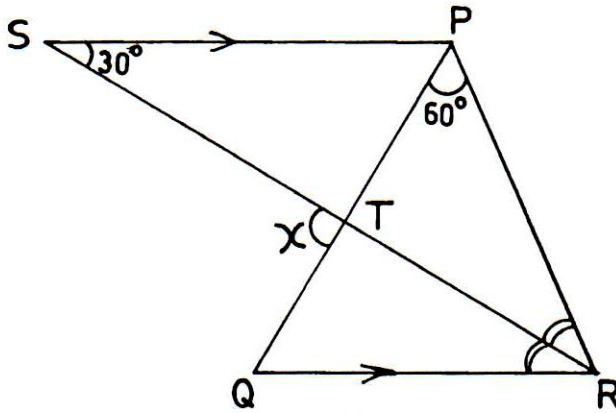
- A. 91°
- B. 89°
- C. 71°
- D. 69°

26. The bearing of P from Q is $N5^\circ W$. 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. $\frac{x^2y^2}{18y - 45x}$

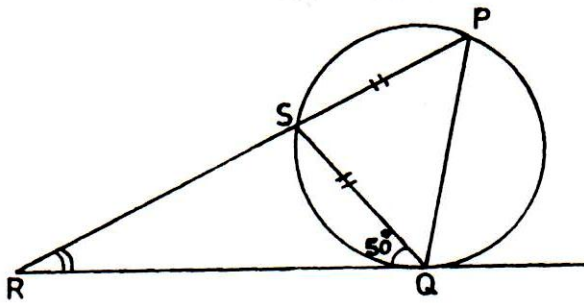
36.



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

- A. 105°
- B. 100°
- C. 95°
- D. 90°

37.



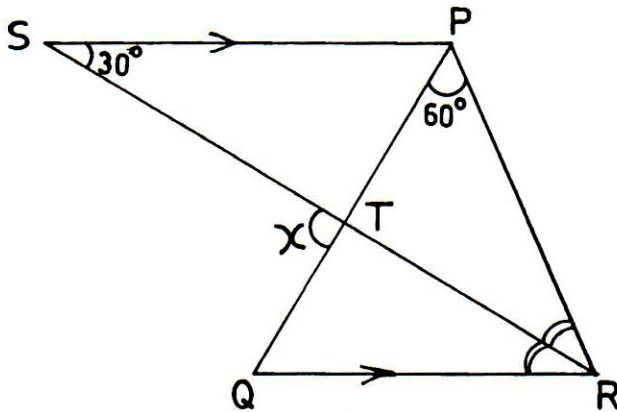
In the diagram, \overline{RQ} is a tangent to the circle, $|PS| = |SQ|$ and $\angle SQR = 50^\circ$. Calculate $\angle SRQ$.

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

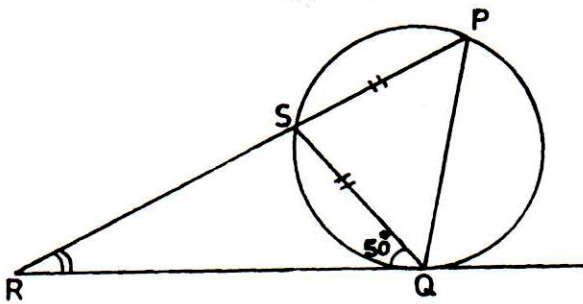
36.



In the figure, $PS \parallel QR$. SR bisects angle PRQ . If $\angle PST = 30^\circ$ and $\angle RPQ = 60^\circ$, 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 $\angle SQR = 50^\circ$. 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.

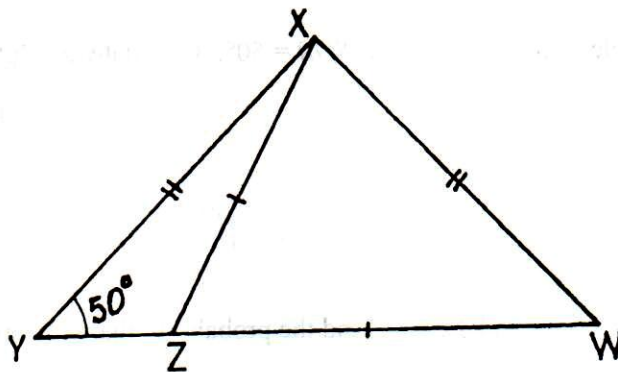
- A. $\frac{5}{18}$
- B. $\frac{2}{9}$
- C. $\frac{5}{9}$
- D. $\frac{20}{81}$

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.

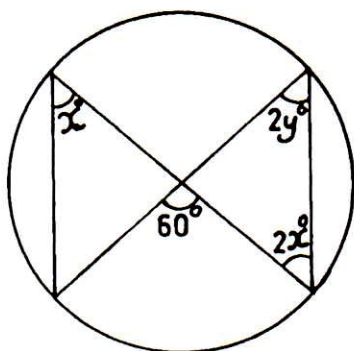


In the diagram, WXY is a triangle. $|XY| = |XW|$, $|XZ| = |WZ|$ and $\angle XYZ = 50^\circ$. Find $\angle XZW$.

- A. 55°
 B. 65°
 C. 70°
 D. 80°

43. Express the sum of 10^{-2} and 10^{-3} in standard form.
- A. 1.0×10^{-6}
 - B. 1.0×10^{-4}
 - C. 1.1×10^{-3}
 - D. 1.1×10^{-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 $p \text{ cm}^2$.
- 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.

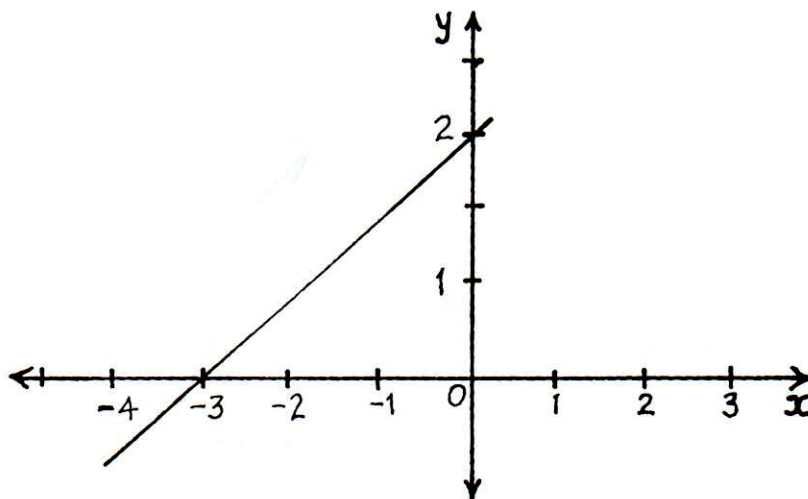


Find the value of y in the diagram.

- 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

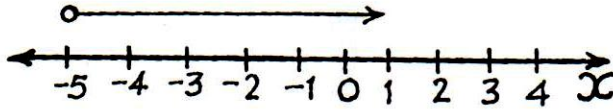
49.



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. $x \leq -5$