MATHEMATICS

(2010)

1. Find $r, if\ 6r7_8 = 511_9$

A. 5

B. 2

C. s

D. 6

2. Simplify $(\frac{3}{4} of \frac{7}{9} \div 9\frac{1}{2})$

A. $\frac{1}{25}$

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

C. $\frac{1}{5}$

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

3. A student measures a piece of rope and found that it was 1.26 m long. If the actual length of the rope was 1.25 m, what was the percentage error in the measurement?

A. 0.40%

B. 0.01%

C. 0.25%

D. 0.80%

4. At what rate will be interest on ₦400 increase to ₦24 in 3 years reckoning in simple interest?

A. 4%

B. 2%

C. 3%

D. 5%

5. If $p: q = \frac{2}{3}: \frac{5}{6}$ and $q: r = \frac{3}{4}: \frac{1}{2}$, find $p: q: r$.

A. 9:10:15

B. 12:15:16

C. 12:15:10

D. 10:15:24

6. Evaluate $(\frac{81}{16})^{\frac{-1}{4}} X\ 2^{-1}$

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

B. 6

C. 3

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

7. Given that log 2 = 0.3010, log 7 = 0.8451. Evaluate log 112.

A. 2.5441

B. 2.0491

C. 2.1461

D. 3.1461

8. Rationalise $\frac{2\sqrt{3}+\sqrt{5}}{\sqrt{5}-\sqrt{3}}$

A. $\frac{3\sqrt{15}+11}{2}$

B. $\frac{3\sqrt{15}-11}{2}$

C. 3√15 − 11

D. 3√15 − 11

9. Express the product of 0.21 and 0.34 in standard form

A. $7.14\ x\ 10^{-3}$

B. $7.14\ x\ 10^{-1}$

C. $7.14\ x\ 10^{-2}$

D. $7.14\ x\ 10^{-4}$

10. Which of the Venn diagrams below represents P' ∩ Q' ∩ R' ?

A. 

B. 

C. 

D. 

11. In a survey of 50 newspaper readers, 40 read Champion and 30 read Guardian, how many read both papers?

A. 15

B. 5

C. 10

D. 20

12. Make Q the subject of formula if $P\frac{M}{5}(x+Q)+1$

A. $\frac{5P+Mx-5}{M}$

B. $\frac{5P-Mx-5}{M}$

C. $\frac{5P-Mx+5}{M}$

D. $\frac{5P+Mx+5}{M}$

13. If $9x^2+6xy+4y^2$ is a factor of $27x^3-8y^3$, find the other factor.

A. $3x-2y$

B. $2y-3x$

C. $2y+3x$

D. $3x+2y$

14. Factorize completely $\frac{x^2+3x^2-10x}{2x^2-8}$

A. $\frac{x^2+5}{2x+4}$

B. $\frac{x(x+5)}{2(x+2)}$

C. $\frac{x(x-5)}{2(x+2)}$

D. $\frac{x(x-5)}{2(x-2)}$

15. Solve for x and y if x - y = 2 and x^2-x^2 = 8

A. (1, 3)

B. (3, 1)

C. (-1, 3)

D. (-3, 1)

16. If y varies directly as the square root of x and y =3 when x = 16, calculate y when x = 64

A. 5

B. 12

C. 6

D. 3

17. If x is inversely proportional to y and $x = 2\frac{1}{2}$ when $y = 2$, find x if $y = 4$

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

B. 5

C. 4

D. $1\frac{1}{4}$

18. For what range of values of x is $\frac{1}{2}x + \frac{1}{4} > \frac{1}{4}x + \frac{1}{2}$?

A. $x > -\frac{3}{2}$

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

C. $x < \frac{2}{3}$

D. $x > -\frac{-2}{3}$

19. Solve the inequalities -6 ≤ 4 - 2 < 5 - x

A. -1 ≤ x < 6

B. -1 < x ≤ 5

C. -1 < x < 5

D. -1 ≤ x ≤ 6

20. Find the sum to infinity of the following series. 0.5 + 0.05 + 0.005 + 0.0005 +...

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

B. $\frac{5}{7}$

C. $\frac{5}{8}$

D. $\frac{5}{11}$

21. The 3rd term of an arithmetic progression is -9 and the 7^{th} term is -29. Find the 10th term of the progression

A. 44

B. -165

C. -44

D. 165

22. If x * y = x + y2, find then value of (2*3)*5

A. 36

B. 11

C. 25

D. 55

23. If p and q are two non-zero numbers and 18$(p + q)$ = $(18 + p)q$, which of the following must be true?

A. q = 18

B. p = 18

C. p <1

D. q < 1

24. If $\begin{vmatrix} x & 3 \\ 2 & 7 \end{vmatrix}$ = 15, find the value of x

A. 3

B. 5

C. 4

D. 2

25. Evaluate $\begin{vmatrix} 2 & 0 & 5 \\ 4 & 6 & 3 \\ 8 & 9 & 1 \end{vmatrix}$

A. -42

B. 102

C. 18

D. -102

26. If $P = \begin{bmatrix} 2 & -3 \\ 1 & 1 \end{bmatrix}$, what is P^{-1}

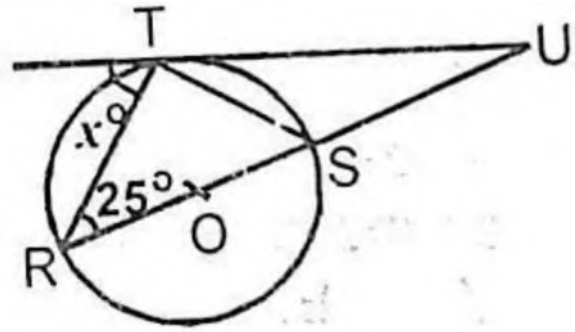
A. $\begin{bmatrix} \frac{1}{5} & \frac{3}{5} \\ \frac{1}{5} & \frac{2}{5} \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{5} & \frac{3}{5} \\ -\frac{1}{5} & \frac{2}{5} \end{bmatrix}$

C. $\begin{bmatrix} -\frac{1}{5} & \frac{3}{5} \\ -\frac{1}{5} & \frac{2}{5} \end{bmatrix}$

D. $\begin{bmatrix} -\frac{1}{5} & -\frac{3}{5} \\ -\frac{1}{5} & -\frac{2}{5} \end{bmatrix}$

27. From the diagram, find x



A. 65°

B. 50°

C. 55°

D. 75°

28. The interior angles of a quadrilateral are $(x + 15)^0, (2x - 45)^0$ and $(x + 10)^0$. Find the value of the least interior angle.

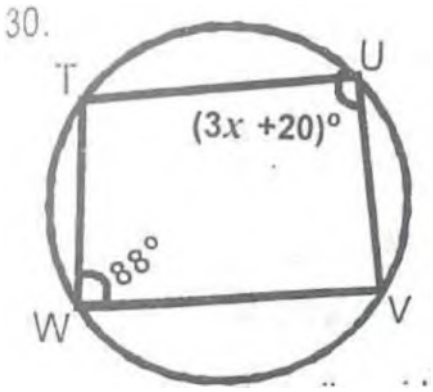
A. 102°

B. 52°

C. 82°

D. 112°

29. From the cyclic quadrilateral TUVW, find the value of x



A. 23°

B. 26°

C. 24°

D. 20°

30. If the two smaller sides of a right-angled triangle are 4 cm and 5 cm, find its area.

A. 10 cm^2

B. 6 cm^2

C. 8 cm^2

D. 24 cm^2

31. An arc subtends an angle of 50° at the centre of circle of radius 6cm. Calculate the area of the sector formed

A. $\frac{90}{7} cm^2$

B. $\frac{110}{7} cm^2$

C. $\frac{100}{7} cm^2$

D. $\frac{80}{7} cm^2$

32. A cylindrical pipe 50cm long with radius 7m has one end open. What is the total surface area of the pipe?

A. 700 nm^2

B. 98 nm^2

C. 350 nm^2

D. 749 nm^2

33. What is the locus of point that is equidistant from points $P(1,3)$ and $Q(3,5)$?

A. y = -x + 6

B. y = -x + 6

C. y = -x - 6

D. y = x - 6

34. Find the distance between the points $(\frac{1}{2}, \frac{1}{2})$ and $(-\frac{1}{2}, -\frac{1}{2})$

A. √2

B. 0

C. 1

D. √3

35. Find the gradient of the line passing through the points P(1, 1) and $Q(2, 5)$.

A. 4

B. 2

C. 3

D. 5

36. Find the equation of a line parallel to y = -4x + 2 passing through (2,3)

A. y - 4x + 11 = 0

B. y - 4x - 11 = 0

C. y + 4x + 11 = 0

D. y + 4x - 11 = 0

37. If $cot\ \theta = \frac{8}{15}$, where θ is acute, find sin θ

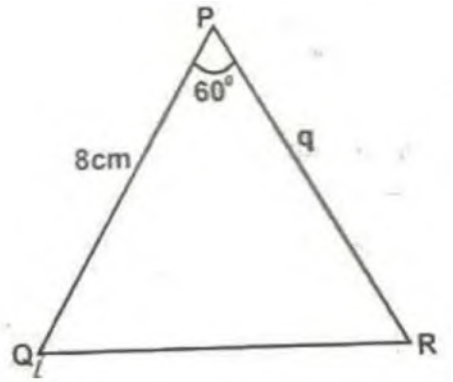
A. $\frac{13}{15}$

B. $\frac{15}{17}$

C. $\frac{8}{17}$

D. $\frac{16}{17}$

38. If the area of △ PQR shown is 12√3 cm2, find the value of q?



A. 6 cm

B. 8 cm

C. 7 cm

D. 5 cm

39. If $y = (2x + 1)3$, find $\frac{dy}{dx}$

A. 3(2x+1)2

B. 3(2x + 1)

C. 6(2x + 1)

D. 6(2x+1)2

40. If $y = xsinx$, find $\frac{dy}{dx}$

A. $\sin x + x \cos x$

B. $sinx + x\ cosx$

C. $sinx - xcosx$

D. $sinx - cosx$

MATHEMATICS

(2011)

1. If $2q3_5 = 77_8$, find q

A. 2

B. 1

C. 4

D. 0

2. Simplify $\frac{\cancel{3}^{2} \times \cancel{6}^{5} \times \cancel{5}^{2}}{\cancel{11}_{15} \times \cancel{3}_{4} \times \cancel{27}_{2}}$

A. $5\frac{2}{3}$

B. 30

C. $4\frac{1}{3}$

D. 50

3. A man invested ₦5,000 for 9 months at 4%. What is the simple interest?

A. ₦150

B. ₦220

C. ₦130

D. ₦250

4. If the numbers M, N, Q are in the ratio 5:4:3, find the value of $\frac{2N-Q}{M}$

A.2

B.3

C.1

D.4

5. Simplify $(\frac{16}{81})^{\frac{1}{4}} \div (\frac{9}{16})^{-\frac{1}{2}}$

A. 23

B. 12

C. 89

D. 13

6. If $log_3 18 + log_3 3 - log_3 x = 3, find\ x.$

A. 1

B. 2

C. 0

D. 3

7. Rationalize $\frac{2-\sqrt{5}}{3-\sqrt{5}}$

A. $\frac{1-\sqrt{5}}{2}$

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

C. $\frac{\sqrt{5}-1}{2}$

D. $\frac{1+\sqrt{5}}{4}$

8. Simplify $[\sqrt{2}+\frac{1}{\sqrt{3}}][\sqrt{2}-\frac{1}{\sqrt{3}}]$

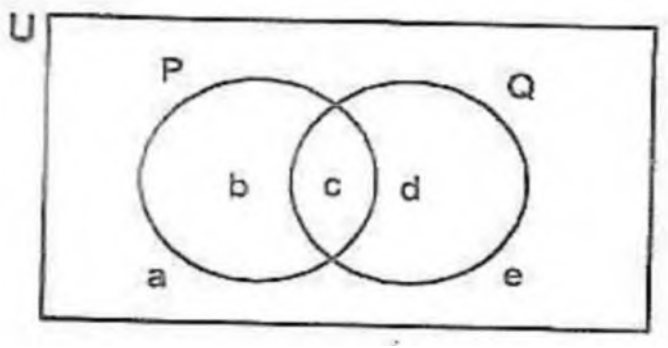
A. $\frac{7}{3}$

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

C. $\frac{5}{2}$

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

9. From the Venn diagram shown, the complement of the set P ∩ Q is given by



A. {a, b, d, e}

B. {b, d}

C. {a, e}

D. {c}

10. Raial has 7 different posters to be hanged in her bedroom, living room and kitchen. Assuming she has plans to place at least a poster in each of the 3 rooms, how many choices does she have?

A. 49

B. 170

C. 21

D. 210

11. Make R the subject of the formula if $T = \frac{KR^2+M}{3}$

A. $\sqrt{\frac{3T-K}{M}}$

B. $\sqrt{\frac{3T-M}{K}}$

C. $\sqrt{\frac{3T+K}{M}}$

D. $\sqrt{\frac{3T-K}{M}}$

12. Find the remainder when $2x^2 + 3x - 3$ is divided by $x^2 + 1$

A. 2x - 1

B. x + 3

C. 2x + 1

D. x – 3

13. Factorize completely $9y^2 - 16x^2$

A. $(3y - 2x)(3y + 4x)$

B. $(3y + 4x)(3y + 4x)$

C. $(3y + 2x)(3y - 4x)$

D. $(3y - 4x)(3y + 4x)$

14. Solve for x and y respectively in the simultaneous equations -2x - 5y = 3, x + 3y = 0

A. -3, -9

B. 9, -3

C. -9, 3

D. 3, -9

15. If x varies directly as square root of y and x = 81 when y = 9. Find x when y = $1\frac{7}{9}$

A. $20\frac{1}{4}$

B. 27

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

D. 36

16. T varies inversely as the cube of R. When R = 3, T = $\frac{2}{81}$. find T when R = 2

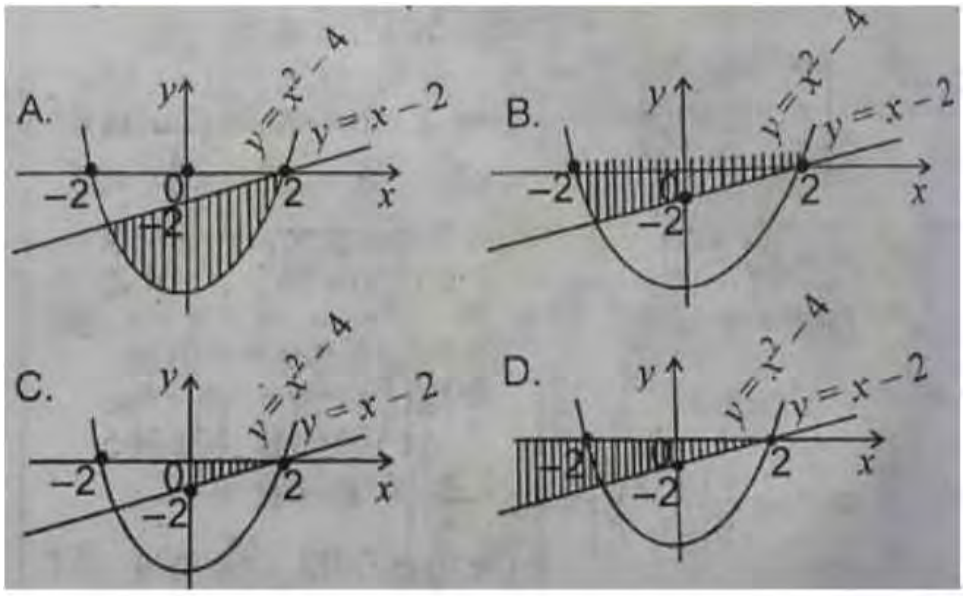
A. $\frac{1}{18}$

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

C. $\frac{1}{24}$

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

17. Which of the following diagrams represents the solution of the inequalities $y \leq x - 2$ *and* $y \geq x^2 - 4$?



18. Solve the inequality $-6(x + 3) \leq 4(x - 2)$

A. $x \leq 2$

B. $x \geq -1$

C. $x \geq -2$

D. $x \leq -1$

19. Solve the inequality $2 + 2 > 15$.

A. $x < -3$ *or* $x > 5$

B. $-5 < x < 3$

C. $x < 3$ *or* $x > 5$

D. $x > 3$ *or* $x < -5$

20. Find the sum of the first 18 terms of the series 3, 6, 9..., 36.

A. 505

B. 513

C. 433

D. 635

21. The second term of a geometric series is 4 while the fourth term is 16. Find the sum of the first five terms

A. 60

B. 62

C. 54

D. 64

22. A binary operation $\oplus$ on real numbers is defined by x $\oplus$ y = xy + x + y for two real numbers x and y. Find the value of 3 $\oplus -\frac{2}{3}$

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

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

C. -1

D. 2

23. If $\begin{vmatrix} 2 & 3 \\ 5 & 3x \end{vmatrix} = \begin{vmatrix} 4 & 1 \\ 1 & 2x \end{vmatrix}$, find the value of x.

A. -6

B. 6

C. -12

D. 12

24. Evaluate $\begin{vmatrix} 4 & 2 & -1 \\ 2 & 3 & -1 \\ -1 & 1 & 31 \end{vmatrix}$

A. 25

B. 45

C. 15

D. 55

25. The inverse of matrix N = $\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ is

A. $\frac{1}{5}\begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$

B. $\frac{1}{5}\begin{bmatrix} 4 & -3 \\ -1 & 2 \end{bmatrix}$

C. $\frac{1}{5}\begin{bmatrix} 2 & -1 \\ -3 & 4 \end{bmatrix}$

D. $\frac{1}{5}\begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$

26. What is the size of each interior angle of a 12-sided regular polygon?

A. 120°

B. 150°

C. 30°

D. 180°

27. A circle of perimeter 28cm is opened to form a square. What is the maximum possible area of the square?

A. 56 cm^2

B. 49 cm^2

C. 98 cm^2

D. 28 cm^2

28. A chord of circle of radius 7 cm is 5 cm from the centre of the maximum possible area of the square?

A. 4√6 cm^2

B. 3√6 cm^2

C. 6√6 cm^2

D. 2√6 cm^2

29. A solid metal cube of side 3 cm is placed in a rectangular tank of dimension 3, 4 and 5 cm. What volume of water can the tank now hold?

A. 48 cm^3

B. 33 cm^3

C. 60 cm^3

D. 27 cm^3

30. The perpendicular bisector of a line XY is the locus of a point

A. whose distance from X is always twice its distance from Y

B. whose distance from Y is always twice its distance from X

C. which moves on the line XY

D. which is equidistant from the points X and Y

31. The midpoint of P(x, y) and Q(8, 6). Find x and y. midpoint = (5, 8)

A. (2, 10)

B. (2, 8)

C. (2, 12)

D. (2, 6)

32. Find the equation of a line perpendicular to line 2y = 5x + 4 which passes through (4, 2).

A. 5y – 2x − 18 = 0

B. 5y + 2x − 18 = 0

C. 5y − 2 x+ 18 = 0

D. 5y + 2 x− 2 = 0

33. In a right-angled triangle, if tan θ = 34. What is $cos\theta - sin\theta$?

A. $\frac{2}{5}$

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

C. $\frac{1}{5}$

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

34. A man walks 100 m due West from a point X to Y, he then walks 100 m due North to a point Z. Find the bearing of X from Z.

A. 195°

B. 135°

C. 225°

D. 045°

35. The derivatives of (2 + 1)(3 + 1) is

A. 12x + 1

B. 6x + 5

C. 6x + 1

D. 12x + 5

36. Find the derivative of $\frac{sin\theta}{cos\theta}$

A. $sec\ 2\theta$

B. $tan\theta cosec\theta$

C. $cosec\theta sec\theta$

D. $cosec\ 2\theta$

37. Find the value of x at the minimum point of the curve $y = x^3 + x^2 - x + 1$

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

B. $-\frac{1}{3}$

C. 1

D. -1

38. Evaluate $\int_0^1 (3-2x)dx$

A. 3

B. 5

C. 2

D. 6

39. Find $\int \cos 4x\, dx$

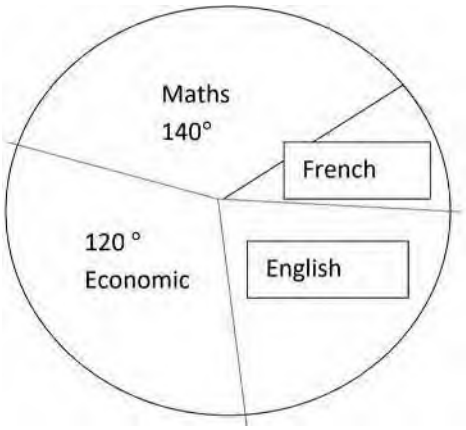
A. $\frac{3}{4} sin\ 4x + k$

B. $-\frac{1}{4} sin\ 4x + k$

C. $-\frac{3}{4} sin\ 4x + k$

D. $-\frac{1}{4} sin\ 4x + k$

40. The pie chart shows the distribution of courses offered by students. What percentage of the students offer English?



A. 30%

B. 25%

C. 35%

D. 20%

MATHEMATICS

(2012)

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1. Convert 72_6 to a number in base three

A. 2211

B. 2121

C. 1212

D. 1122

2. Simplify $\frac{2\frac{2}{3}\times 1\frac{1}{2}}{4\frac{4}{5}}$

A. 114

B. 116

C. 56

D. 45

3. Evaluate $\frac{21}{9}$ to 3 significant figures

A. 2.30

B. 2.31

C. 2.32

D. 2.33

4. A man earns ₦3,500 per month out of which he spends 15% on his children's education. If he spends additional ₦1,950 on food, how much does he have left?

A. ₦525

B. ₦1,025

C. ₦1,950

D. ₦2,975

5. If $27^{x+2} \div 9^{x+1} = 3^{2x}, find\ x$

A. 3

B. 4

C. 5

D. 6

6. If $log_3\ x^2 = -8$, what is x?

A. 13

B. 19

C. 127

D. 181

7. Simplify $(\sqrt{6}+2)^2-(\sqrt{6}+2)^2$

A. 2√6

B. 4√6

C. 8√6

D. 16√6

8. If P is a set of all prime factors of 30 and Q is a set of all factors of 18 less than 10, find P ∩ Q

A. {3}

B. {2,3}

C. {2,3,5}

D. {1,2}

9. In a class of 46 students, 22 play football and 26 play volleyball. If 3 students play both games, how many plays neither?

A. 1

B. 2

C. 3

D. 4

10. Make 'n' the subject of the formula if $w=\frac{v(2+cn)}{1-cn}$

A. $\frac{1}{c}(\frac{w-2v}{v+w})$

B. $\frac{1}{c}(\frac{w-2v}{v-w})$

C. $\frac{1}{c}(\frac{w+2v}{v-w})$

D. $\frac{1}{c}(\frac{w+2v}{v+w})$

11. Find the remainder when $2x^3-11x^2+8x-1$ is divided by $x+3$

A. -871

B. -781

C. -187

D. -178

12. Solve for x and y in the equations below

$x^2-y^2=4$

$x+\ y=2$

A. $x = 0, y = -2$

B. $x = 0, y = 2$

C. $x = 2, y = 0$

D. $x = -2, y = 0$

13. If y varies directly as √ and y = 4 when n = 4, find y when n = 1

A. $\sqrt{17}$

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

C. $\frac{8}{3}$

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

14. U is inversely proportional to the cube of V and U = 81 when V= 2. Find U when V = 3

A. 24

B. 27

C. 32

D. 36

15. The value of y for which $\frac{1}{5}y + \frac{1}{5} < \frac{1}{2}y + \frac{2}{5}$

A. $y > \frac{2}{3}$

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

C. $y > -\frac{2}{3}$

D. $y < -\frac{2}{3}$

16. Find the range of values of m which satisfy $(m - 3)(m - 4) < 0$

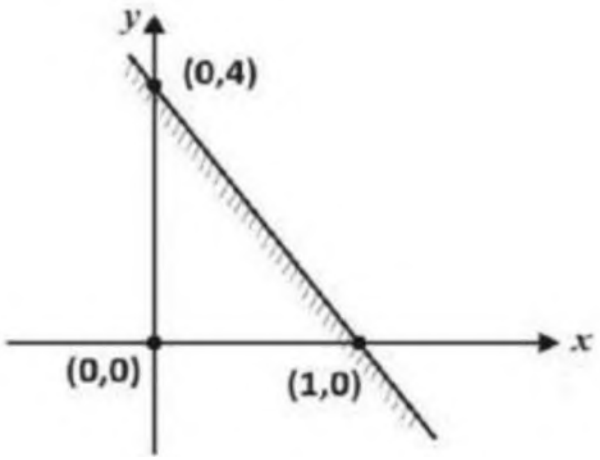
A. $2 < m < 5$

B. $-3 < m < 4$

C. $3 < m < 4$

D. $-4 < m < 3$

17. The shaded region in the diagram is represented by the equation



A. $y \leq 4x + 2$

B. $y \geq 4x + 2$

C. $y \leq -4x + 4$

D. $y \leq 4x + 4$

18. The nth term of a sequence is $n^2 - 6n - 4$. Find the sum of the 3rd and 4th terms.

A. 24

B. 23

C. -24

D. -25

19. The sum to infinity of a geometric progression is $-\frac{1}{10}$ and the first term is $-\frac{1}{8}$. Find the common ratio of the progression.

A. $-\frac{1}{5}$

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

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

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

20. The binary operation * is defined on the set of integers such that p * q = pq + p - q. Find 2 * (3 * 4)

A. 11

B. 13

C. 15

D. 22

21. The binary operation on the set of real numbers is defined by $m * n = mn^2$ for all $m, n \in R$. If the identity element is 2, find the inverse of -5

A. −45

B. −25

C. 4

D. 5

22. If $\begin{vmatrix} 5 & 3 \\ x & 2 \end{vmatrix} = \begin{vmatrix} 3 & 5 \\ 4 & 5 \end{vmatrix}$, find the value of x

A. 3

B. 4

C. 5

D. 7

23. Given that 13 is a unit matrix of order 3, find $|1_3|$

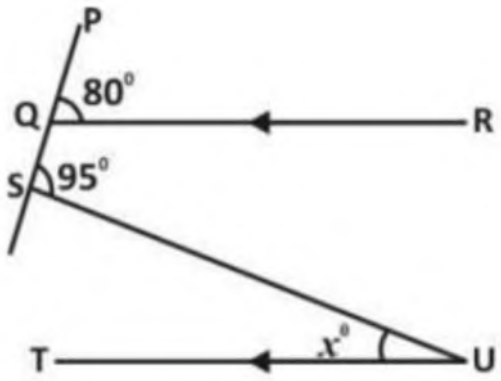
A. -1

B. 0

C. 1

D. 2

24. In diagram, QR//TU, < PQR = 80^0 and < PSU= 95^0. Calculate $< SUT$.



A. 15°

B. 25°

C. 30°

D. 80°

25. The angles of a polygon are given by x, 2x, 3x, 4x and 5x respectively. Find the value of x.

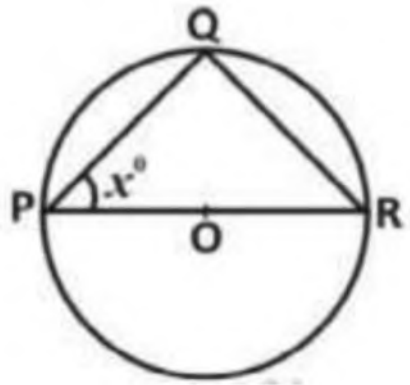
A. 24°

B. 30°

C. 33°

D. 36°

26. In the diagram shown, PQR is a circle centre O. If $< QPR$ is XO, find $< QRP$.



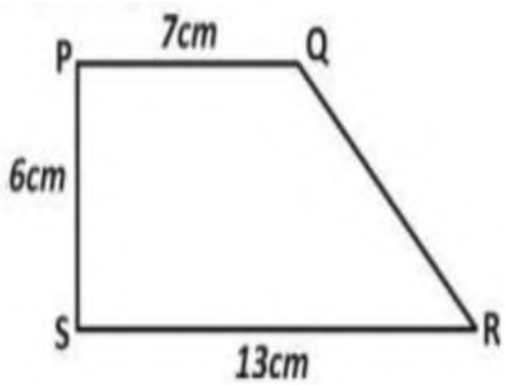
A. x^0

B. $(90 - x)°$

C. $(90 + x)°$

D. $(180 - x)°$

27. Find the area of the trapezium shown.



A. 91 cm^2

B. 78 cm^2

C. 60 cm^2

D. 19 cm^2

28. A circular arc subtends angle 150° at the centre of a circle of radius 12 cm. Calculate the area of the sector of the arc?

A. 30 π cm^2

B. 60 π cm^2

C. 120 π cm^2

D. 150 π cm^2

29. Calculate the volume of a cuboid of length 0.76 cm, breadth 2.6 cm and height 0.82 cm.

A. 3.92 cm3

B. 2.13 cm3

C. 1.97 cm3

D. 1.62 cm3

30. The locus of a point equidistant from the intersection of lines $3x - 7y + 7 = 0$ and $4x + 6y + 1 = 0$ is a

A. line parallel to $7x + 13y + 8 = 0$

B. circle

C. semicircle

D. bisector of the line $7x + 13y + 8 = 0$

31. The gradient of the straight line joining the points P(5, -7) and Q(-2, -3) is

A. 12

B. 25

C. −47

D. −23

32. The distance between the point (4, 3) and the intersection of $y = 2x + 4$ and $y = 7 - x$ is

A. √13

B. 3√2

C. √26

D. 10√5

33. Find the equation of the line through the points (-2, 1) and $(-\frac{1}{2}, 4)$

A. y = 2x - 3

B. y = 2x + 5

C. y = 3x - 2

D. y = 2x + 1

34. If angle θ is 135°, evaluate cos θ

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

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

C. $-\frac{\sqrt{2}}{2}$

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

35. A man stands on atree 150cm high and sees a boat at an angle of depression of 74°. Find the distance of the boat from the base of the tree.

A. 52 cm

B. 43 cm

C. 40 cm

D. 15 cm

36. If $y = x^2 - \frac{1}{x}$, find $\frac{dy}{dx}$

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

B. $2x + x^2$

C. $2x - x^2$

D. $2x + \frac{1}{x^2}$

37. Find $\frac{dy}{dx}$ if $y = \cos x$

A. sin x

B. $-\sin x$

C. $\tan x$

D. $-\tan x$

38. Evaluate $\int_1^2 (x^2 - 4x)dx$

A. $\frac{11}{3}$

B. $\frac{3}{11}$

C. $-\frac{3}{11}$

D. $-\frac{11}{3}$

39. Evaluate $\int_0^{\frac{\pi}{4}} sec^2\theta \, d\theta$

A. 1

B. 2

C. 3

D. 4

40. The grades of 36 students in a class test are as shown in the pie chart. How many students have excellent?

A. 12

B. 9

C. 8

D. 7

MATHEMATICS

(2013)

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1. Convert 27_{10} to another number in base three

A. 1100_3

B. 1000_3

C. 1001_3

D. 1010_3

2. 3 girls share a number of apples in the ration 5:3:2. If the highest share is 40 apples, find the smallest share

A. 16

B. 38

C. 36

D. 24

3. Evaluate $\frac{1.25 \times 0.025}{0.05}$, correct to 1decimal place

A. 6.3

B. 0.5

C. 0.6

D. 6.2

4. Calculate the time taken for ₦3000 to earn ₦600 if invested at 8% simple interest

A. $3\frac{1}{2}$ years

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

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

D. 3 years

5. Simplify $3 - 5n91 - n \times 27n + 1$

A. 32

B. 33

C. 35

D. 3

6. If $log_{10}\ 4 = 0.6021$, evaluate $log_{10}4^{\frac{1}{3}}$

A. 1.8063

B. 0.2007

C. 0.3011

D. 0.9021

7. Simplify $\frac{\sqrt{5(\sqrt{147}-\sqrt{12})}}{\sqrt{15}}$

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

B. 9

C. 5

D. $\frac{1}{5}$

8. P, Q and R are subsets of the universal set U. The Venn diagram showing the relationship (P∩Q)∪R is

A. 

B. 

C. 

D. 

9. If $P = \{x: x\ is\ odd, -1 < x \leq 20\}$ and $\{y: y\ is\ prime, -2 < y \leq 25\}$, find $P \cap Q$

A. {3, 5, 7, 11, 13, 17, 19}

B. {2, 3, 5, 7, 11, 13, 17, 19}

C. {3, 5, 7, 11, 17, 19}

D. {3, 5, 11, 13, 17, 19}

10. If $\sqrt{t^2 - 4t + 4}$ find t in terms of S

A. $S - 2$

B. $s^2 + 2$

C. $s^2 - 2$

D. S + 2

11. If $x - 4$ is a factor of $x^2 - x - k$ then k is

A. 20

B. 2

C. 4

D. 12

12. The remainder when $6P^3 - P^2 - 47P + 30$ is $P - 3$ is

A. 63

B. 18

C. 21

D. 42

13. P varies jointly as m and u, and varies inversely as q. Given that p = 4, m = 3 and u = 2 and q = 1, find the value of p when m= 6, u= 4 and q=$\frac{8}{5}$

A. 10

B. $\frac{288}{5}$

C. $\frac{128}{5}$

D. 15

14. If r varies inversely as the square root of s and t, how does s vary with r and t?

A. s varies directly as r^2 and t^2

B. s varies directly as r and t

C. s varies inversely as r and t^2

D. s varies inversely as r^2 and t

15. Evaluate $3(x + 2) > 6(x + 3)$

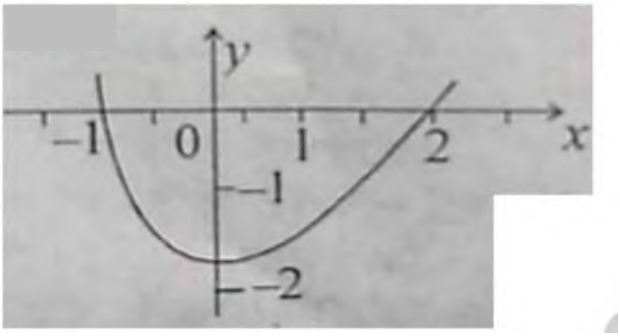
A. $x < -4$

B. $x > 4$

C. $x < 4$

D. $x > -4$

16. The graph is correctly represented by



A. $y = x^2 - x - 1$

B. $y = x^2 + x - 2$

C. $y = x^2 - x - 2$

D. $y = x^2 - 3x + 2$

17. Solve for x: $|x - 2| < 3$

A. $-1 < x < 5$

B. $x < 1$

C. $x < 5$

D. $-1 < x < 3$

18. If the sum of the first two terms of a G.P. is 3, and the sum of the second and the third terms is -6, find the sum of the first term and the common ratio

A. -5

B. 5

C. -2

D. -3

19. The nth term of the progression $\frac{4}{2}, \frac{7}{3}, \frac{10}{4}, \frac{13}{5}, \ldots$ is

A. $\frac{3n+1}{n-1}$

B. $\frac{3n+1}{n+1}$

C. $\frac{1-3n}{n+1}$

D. $\frac{3n+1}{n+1}$

20. If a binary operation * is defined by x * y = x + 2y, find 2* (3 * 4)

A. 14

B. 26

C. 24

D. 16

21. If $P = \begin{bmatrix} 5 & 3 \\ 2 & 1 \end{bmatrix}$ and $Q = \begin{bmatrix} 4 & 2 \\ 3 & 5 \end{bmatrix}$, find 2P + Q

A. $\begin{bmatrix} 7 & 7 \\ 8 & 14 \end{bmatrix}$

B. $\begin{bmatrix} 8 & 14 \\ 7 & 17 \end{bmatrix}$

C. $\begin{bmatrix} 7 & 7 \\ 14 & 8 \end{bmatrix}$

D. $\begin{bmatrix} 14 & 8 \\ 7 & 7 \end{bmatrix}$

22. Find the inverse $\begin{bmatrix} 5 & 3 \\ 6 & 4 \end{bmatrix}$

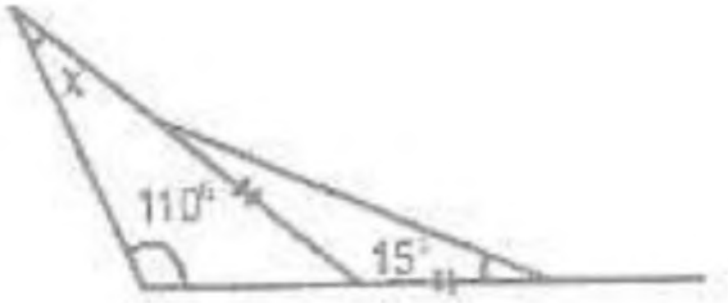
A. $\begin{bmatrix} 2 & \frac{3}{2} \\ 3 & -\frac{5}{2} \end{bmatrix}$

B. $\begin{bmatrix} 2 & \frac{3}{2} \\ -3 & \frac{5}{2} \end{bmatrix}$

C. $\begin{bmatrix} 2 & -\frac{3}{2} \\ -3 & -\frac{5}{2} \end{bmatrix}$

D. $\begin{bmatrix} 2 & -\frac{3}{2} \\ 3 & \frac{5}{2} \end{bmatrix}$

23. In the diagram shown, find the value of x.



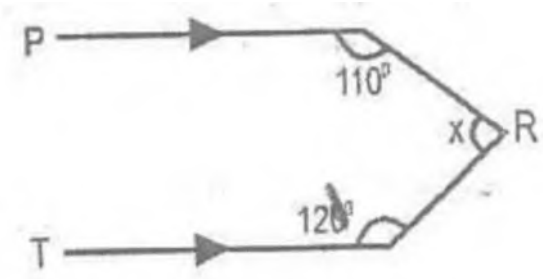
A. 45°

B. 15°

C. 30°

D. 40°

24. The value of x in the figure is



A. 70°

B. 130°

C. 110°

D. 100°

25. If the angles of a quadrilateral are (3y+10)°, (2y+30)°, (y+20)° and 4y°, find the value of y.

A. 66°

B. 12°

C. 30°

D. 42°

26. A square tile has side 30cm. How many of these tiles will cover a rectangular floor of length 7.2m and width 4.2m?

A. 720

B. 336

C. 420

D. 576

27. Find the length of a chord which subtends an angle of 90° at the centre of a circle whose radius is 8cm.

A. 8√3 cm

B. 4 cm

C. 8 cm

D. 8√2 cm

28. A chord of a circle subtends an angle of 120° at the centre of a circle of diameter 4√3cm. Calculate the are of the major sector

A. 32π cm^2

B. 4π cm^2

C. 8π cm^2

D. 16π cm^2

29. The locus of the points which is equidistant from the line PQ forms a

A. perpendicular line to PQ

B. circle centre P

C. circle centre Q

D. pair of parallel lines to PQ

30. If the mid-point of the line PQ is (2,3) and the point P is (-2,1). find the coordinate of the point Q.

A. (8 ,6)

B. (5, 6)

C. (0, 4)

D. (6, 5)

31. Find the equation of the perpendicular bisector of the line joining P (2, 3) to Q(-5, 1)

A. $8y + 14x + 13 = 0$

B. $8y - 14x + 13 = 0$

C. $8y - 14x - 13 = 0$

D. $8y + 14x - 13 = 0$

32. In triangle PQR, q= 8cm, r=6cm and cos p = $\frac{1}{12}$

A. √108 cm

B. √9 cm

C. √92 cm

D. 10 cm

33. If $tan\ \theta = \frac{3}{4}$, find the value of $sin\theta + cos\theta$

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

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

C. $1\frac{3}{5}$

D. $1\frac{2}{5}$

34. If $y = (2x + 2)^3$, find $\frac{dy}{dx}$

A. $3(2x + 2)$

B. $6(2x + 2)^2$

C. $3(2x + 2)^2$

D. $6(2x + 2)$

35. If $= xsinx$, find $\frac{dy}{dy}$

A. $\cos x + \sin x$

B. $\sin x + \mathrm{xcos}\, x$

C. $\sin x + \cos x$

D. $\cos x - x \sin x$

36. The radius of a circle is increasing at the rate of $0.02cms^{-1}$. Find the rate at which the area is increasing when the radius of the circle is 7cm.

A. 0.35 cm^2S^{-1}

B. 0.88cm^2S^{-1}

C. 0.75 cm^2S^{-1}

D. 0.55 cm^2S^{-1}

37. Integrate $\frac{1+x}{x^3}$

A. $2x^2 - \frac{1}{x} + k$

B. $-\frac{1}{2x^2} - \frac{1}{x} + k$

C. $-\frac{x^2}{2} - \frac{1}{x} + k$

D. $x^2 - \frac{1}{x} + k$

38. Evaluate $\int_0^{\frac{\pi}{2}} \sin x \, dx$

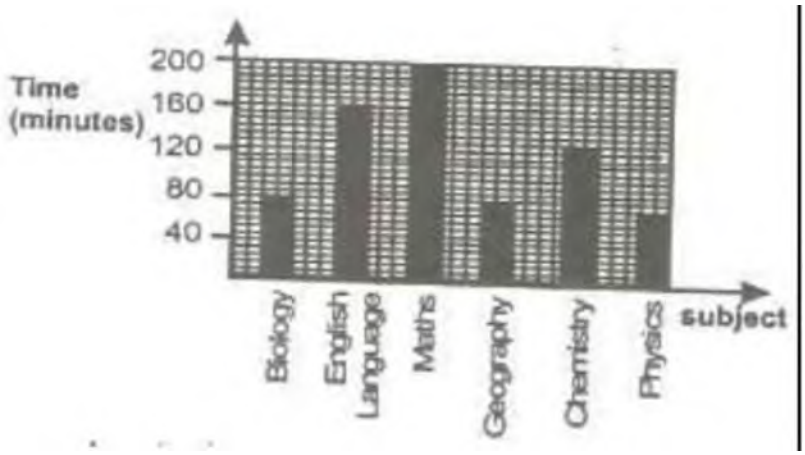
A. -2

B. 2

C. 1

D. -1

39. The bar chart shows the allotment of time (in minutes) per week for selected subjects in a certain school. What is the total time allocated to the six subjects per week?



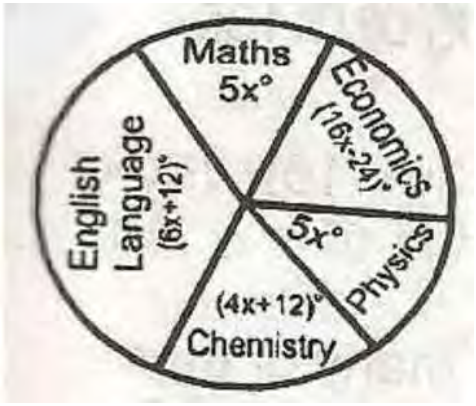
A. 960 mins

B. 200 mins

C. 460 mins

D. 720 mins

40. The pie chart shows the statistical distribution of 80 students in five subjects in an examination. Calculate how many student offer Mathematics.



A. 50

B. 20

C. 30

D. 40

MATHEMATICS

(2014)

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1. Find the value of $110111_2 + 10100_2$

A. 1001111_2

B. 1101011_2

C. 100101_2

D. 1001111_2

2. A woman bought a grinder for ₦60,000. She sold it at a loss of 15%. How much did she sell it?

A. ₦50,000

B. ₦53,000

C. ₦52,000

D. ₦51,000

3. Express the product of 0.00043 and 2000 in standard form.

A. 8.6 x 10

B. 8.3 x 10^{-3}

C. 8.6 x 10^{-2}

D. 8.6 x 10^{-1}

4. A man donates 10% of his monthly net earnings to his church. If it amounts to ₦4,500, what is his net monthly income?

A. ₦62,500

B. ₦40,500

C. ₦45,000

D. ₦52,500

5. If log 7.5 = 0.8751, evaluate 2 log 75 + log 750.

A. 66.253

B. 6.6252

C. 6.6253

D. 66.252

6. Solve for x in $8x^{-2} = \frac{2}{25}$

A. 10

B. 4

C. 6

D. 8

7. Simplify $\frac{2\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$

A. 3√6 + 1

B. 3√6 − 7

C. 3√6 + 7

D. 3√6 − 1

8. Evaluate $log_2 8 + log_2 16 - log_2 4$

A.6

B.3

C.4

D.5

9. If P = {1,2,3,4,5} and P ∪ Q = {1,2,3,4,5,6,7}, list the elements in Q

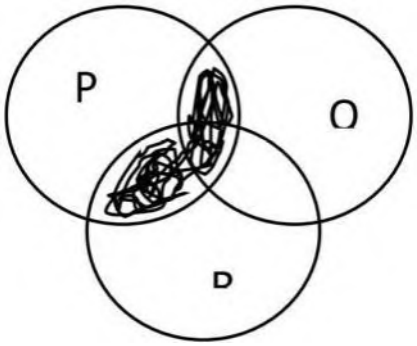
A. {5, 7}

B. {6}

C. {7}

D. {6, 7}

10. From the Venn diagram, the shaded parts represent



A. $(P \cap Q) \cap (P \cap R)$

B. $(P \cap Q) \cup (P \cap R)$

C. $(P \cup Q) \cap (P \cup R)$

D. $(P \cup Q) \cup (P \cup R)$

11. If $gt^2 - k - w = 0$, make g the subject of the formula

A. $\frac{k-w}{t}$

B. $\frac{k+w}{t^2}$

C. $\frac{k-w}{t^2}$

D. $\frac{k+w}{t}$

12. Factorize $2y^2 - 15xy + 18x^2$

A. $(3y + 2x)(y - 6x)$

B. $(2y - 3x)(y + 6x)$

C. $(2y - 3x)(y - 6x)$

D. $(2y + 3x)(y - 6x)$

13. Find the value of k if $y - 1$ is a factor of $y^3 + 4y^2 + ky - 6$

A. 0

B. -6

C. -14

D. 1

14. If y varies directly as w^2. When y = 8, w = 2. Find y when w = 3

A. 6

B. 18

C. 12

D. 9

15. P varies directly as Q and inversely as R. When Q = 36 and R = 16, P = 27. Find the relation between P, Q and R.

A. $P = \frac{12}{QR}$

B. $P = \frac{Q}{12R}$

C. $P = \frac{12Q}{R}$

D. $P = 12QR$

16. What is the solution of $\frac{x-5}{x+3} < -1$?

A. $x < -3 \; or \; x > 5$

B. $-3 < x < 1$

C. $x < -3 \; or \; x > 1$

D. $-3 < x < 5$

17. Evaluate the inequality $\frac{x}{2} + \frac{3}{4} \leq \frac{5x}{6} - \frac{7}{12}$

A. $x \geq -4$

B. $x \geq 4$

C. $x \leq 3$

D. $x \geq -3$

18. The 4th term of an A.P. is 13 while the 10^{th} term is 31. Find the 24^{th} term.

A. 69

B. 89

C. 75

D. 73

19. What is the common ratio of the G.P. (√10 + √5)(√10 + 2√5) + ⋯?

A. 5

B. √2

C. √5

D. 3

20. A binary operation * is defined by x * y = xy. If x * 2 = 12 − x, find the possible values of x

A. −3, −4

B. 3, 4

C. 3, −4

D. −3, −4

21. Find y, if $\begin{pmatrix} 5 & 6 \\ 2 & -7 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 7 \\ -11 \end{pmatrix}$

A. 2

B. 8

C. 5

D. 3

22. If $\begin{vmatrix} -x & 12 \\ 1 & 4 \end{vmatrix} = -12$, find x

A. 6

B. −6

C. −2

D. 3

23. Find the value of $\begin{vmatrix} 0 & 3 & 2 \\ 1 & 7 & 8 \\ 0 & 5 & 4 \end{vmatrix}$

A. −2

B. 12

C. 10

D. −1

24. How many sides has a regular polygon whose interior angle is 135^o each?

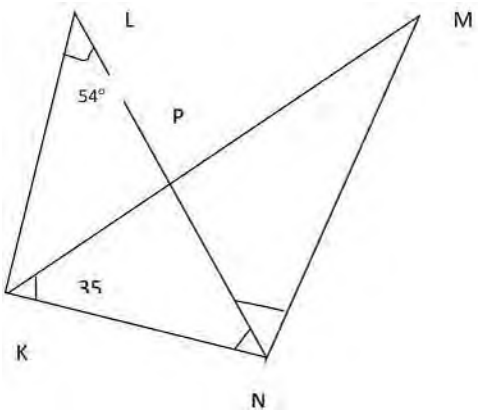
A. 8

B. 12

C. 10

D. 9

25. In the figure shown, KL‖NM, LN bisects <KNM. If angles KLN is 54^o and angle MKN is 35^o, calculate the size of angle KMN.



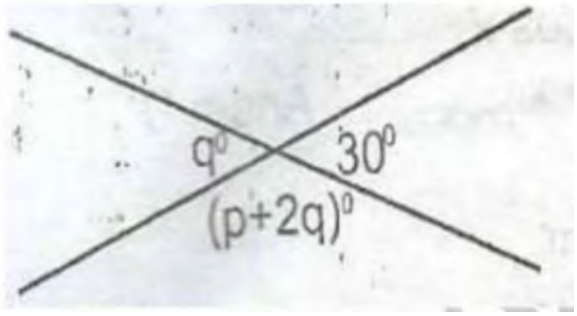
A. 19°

B. 91°

C. 89°

D. 37°

26. From the figure, what is the value of p?



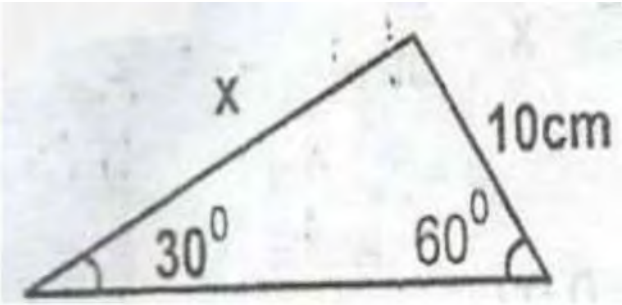
A. 135°

B. 90^o

C. 60^o

D. 45^o

27. Find the value of x in the figure



A. 4√3 cm

B. 120√3 cm

C. 10√3 cm

D. 5√3 cm

28. If the angle of a sector of a circle with radius 10.5 cm is 120°, find the perimeter of the sector.

A. 2.5m

B. 8.0m

C. 7.5m

D. 5.0m

29. A cylindrical tank has a capacity of 6160m3. What is the depth of the tank if the radius of its base is 28cm?

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

A. 8.0m

B. 7.5m

C. 5.0m

D. 2.5m

30. The locus of a dog tethered to a pole with a rope of 4m is a

A. semi-circle with radius 4m

B. circle with diameter 4m

C. circle with radius 4m

D. semi-circle with diameter 4m

31. Find the mid-point of S(−5, 4) and T(−3, −2)

A. 4, −1

B. −4, 2

C. 4, −2

D. −4, 1

32. The gradient of a line joining (x,4) and (1,2) is . Find the value of x

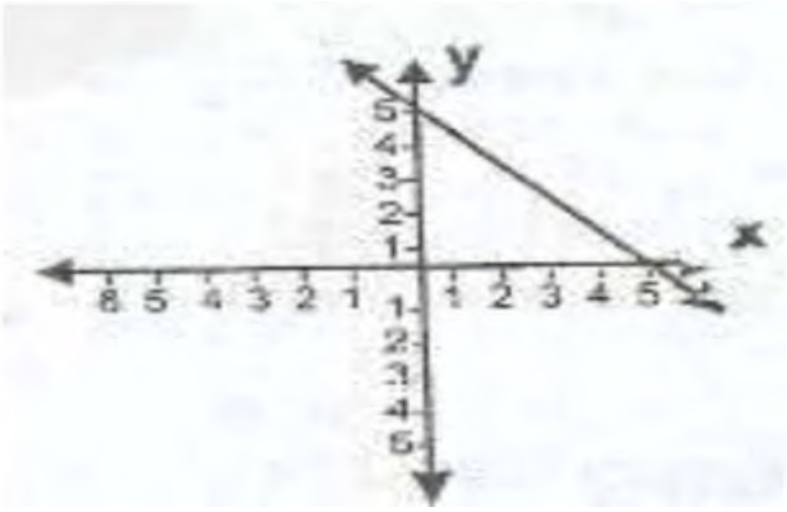
A. −5

B.5

C.3

D. −3

33. In the figure shown, what is the equation of the line that passes the y-axis at (0,5) and passes the x-axis at (5,0)?



A. y = x- 5

B. y = x + 5

C. y = -x + 5

D. y = x – 5

34. Calculate the mid-point of the line segment y − 4x + 3 = 0, which lies between the x-axis and y-axis.

A. $(-\frac{2}{3}, \frac{3}{2})$

B. $(\frac{3}{8}, -\frac{3}{2})$

C. $(\frac{3}{8}, \frac{3}{2})$

D. $(-\frac{3}{2}, \frac{3}{2})$

35. Find the equation of the straight line through (-2, 3) and perpendicular to 4x + 3y - 5 = 0

A. 5x - 2y - 11 = 0

B. 3x - 4y + 18 = 0

C. 3x + 2y - 18 = 0

D. 4x + 5y + 3 = 0

36. If $sin\ \theta = \frac{12}{13}$, find the value of 1 + cos θ

A. $\frac{5}{13}$

B. $\frac{25}{13}$

B. $\frac{18}{13}$

C. $\frac{8}{13}$

37. If $y = \ 4x^3\ - 2x^2 + x$, find $\frac{dy}{dx}$

A. $12x^2 - 4x + 1$

B. $8x^2 - 2x + 1$

C. $8x^2 - 4x + 1$

D. $12x^2 - 2x + 1$

38. If y = cos 3x, find $\frac{dy}{dx}$

A. $-3sin\ 3x$

B. $\frac{1}{3}sin\ 3x$

C. $-\frac{1}{3}sin\ 3x$

D. $3sin\ 3x$

39. Find the minimum value of $y = x^2 - 2x - 3$

A. −4

B.4

C.1

D. −1

40. Evaluate $\int sin\ 2\ dx$

A. $-cos\ 2x + k$

B. $cos\ 2x + k$

C. $\frac{1}{2}cos\ 2x + k$

D. $-\frac{1}{2}cos\ 2x + k$

MATHEMATICS

(2015)

1. The sum of the progression is $1 + x + x^2 + \cdots =$

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

B. $\frac{1}{1+x}$

C. $\frac{1}{x-1}$

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

2. Find a square root of $170 - 20\sqrt{30}$

A. 2√10 − 5

B. 3√5 − 8√6

C. 2√5 − 5√6

D. 5√5 −2√6

3. Multiply $(x + 3y + 5)$ by $(2x^2 + 5y + 2)$

A. $2x^3 + 3yx^2 + 10xy + 15y^2 + 13y + 10x^2 + 2x + 10$

B. $2x^3 + 6yx^2 + 5xy + 15y^2 + 31y + 10x^2 + 2x + 10$

C. $2x^3 + 3yx^2 + 5xy + 10y^2 + 13y + 5x^2 + 2x + 10$

D. $2x^3 + 6yx^2 + 5xy + 15y^2 + 13y + 10x^2 + 2x + 10$

4. A force of 5 units acts on a particle in the direction to the east and another force of 4 units acts on the particle in the direction north-east. The resultant of the two forces is

A. $\sqrt{3}$ units

B. $3\sqrt{units}$

C. $\sqrt{41} + 20\sqrt{2}$ units

D. $\sqrt{41} + 202$ units

5. Simplify $\frac{(a-\frac{1}{a})(a+\frac{1}{a})}{a^2-\frac{1}{a^2}}$

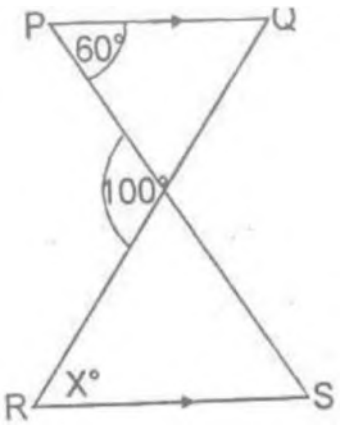
A. $a^{\frac{2}{3}}$

B. $a^{-\frac{1}{2}}$

C. $a^{\frac{1}{5}}$

D. $a^{\frac{1}{3}}$

6. In the diagram, PQ is parallel to RS, calculate the value of x



A. 20°

B. 40°

C. 60°

D. 80°

7. A ladder resting on a vertical wall makes an angle whose tangent is 2.4 with the ground. If the distance between the foot of the ladder and the wall is 50cm, what is the length of ladder?

A. 1.3m

B. 1.1m

C. 1.2m

D. 1.3m

8. After getting a rise of 15%, a man's new monthly salary is ₦345. How much per month did he earn before the increase?

A. ₦350

B. ₦396.75

C. ₦300

D. ₦293.25

9. A trader goes to Ghana for y days with Y cedis. For the first x days, he spends X cedis per day. The amount he has to spend per day for the rest of his stay is

A. $\frac{Y(y+x)}{y-x}$ cedis

B. $\frac{Yy+Xx}{y-x}$ cedis

C. $\frac{Y-xy}{x-y}$ cedis

D. $\frac{Y-Xx}{Y-x}$ cedis

10. The mean of the numbers 1.2, 1.0, 0.4, 1.4, 0.8, 0.8, 1.2 and 1.1 is

A. 1.5

B. 0.8

C. 1.0

D. 1.05

11. A solid cylinder of radius 3cm has a total surface area of 36cm2. Find its height

A. 2cm

B. 3cm

C. 4cm

D. 5cm

12. When a dealer sells a bicycle for ₦81, he makes a profit of 8%. What did he pay for the bicycle?

A. ₦75

B. ₦74.52

C. ₦75

D. ₦75.52

13. Which of the formula below represents the general terms of the following set of numbers?

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

B. $(-)^{n+1}\ \frac{2}{n+1}$

C. $(-)^{n}\ \frac{2}{n+1}$

D. $\frac{n}{2n-1}$

14. Write the decimal number 39 to base 2

A. 100111

B. 110111

C. 111001

D. 100101

15. A pentagon has four of its angles. If the size of the fifth angle is 60°. Find the size of each of the four equal angle is

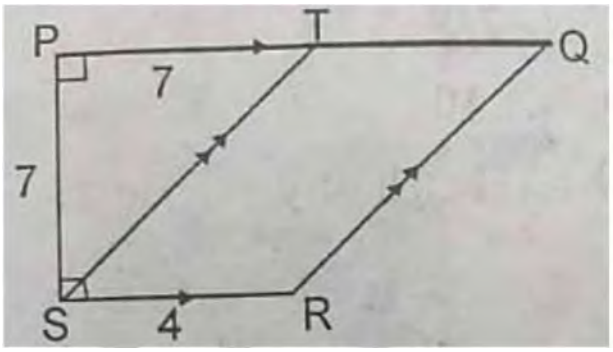
A. 60°

B. 108°

C. 120°

D. 150°

16. In the figure below PQ//SR, ST//RQ, PS = 7cm, PT=7cm, SR=4cm. Find the ratio of the area of QRST to the area of PQRS



A. 56:77

B. 56:105

C. 28:105

D. 28:49

17. Find a two-digit number such that three times the ten digits is 2 less than twice the units digit and twice the units digit and twice the number is 20 greater than the number obtained by reversing the digits.

A. 24

B. 42

C. 74

D. 47

18. If $\begin{vmatrix} 5 & 3 \\ x & 2 \end{vmatrix} = \begin{vmatrix} 3 & 5 \\ 4 & 5 \end{vmatrix}$, find the value of x

A. 3

B. 4

C. 5

D. 7

19. Evaluate $\begin{vmatrix} 4 & 2 & -1 \\ 2 & 3 & -1 \\ -1 & 1 & 31 \end{vmatrix}$

A. 25

B. 45

C. 15

D. 55

20. Marks scored by some children in an arithmetic test are 5, 3, 6, 9, 4, 7, 8, 6, 2, 7, 8, 4, 5, 2, 1, 0, 6, 9, 0, 8. The arithmetic mean of the marks is

A. 6

B. 5

C. 7

D. 4

21. The graphical methods of solving the equation $x^3 - 3x^2 + 4x - 28 = 0$ and is by drawing the graphs of the curves

A. $y = x^3$ and $y = 3x^2 + 4x - 28$

B. $y = x^3 + 3x^2 + 4x - 28$ and the line $y = 1$

C. $y = x^3 + 3x^2 + 4x$ and $y = \frac{28}{x}$

D. $y = x^2 + 3x + 4$ and $y = \frac{28}{x}$

22. A sector of a circle is bounded by two radii 7 cm long and an arc of length 6cm. Find the area of the sector.

A. 42 cm^2

B. 3 cm^2

C. 21 cm^2

D. 24 cm^2

23. Express 150 kilometres per second in metres per hour.

A. 7.8×10^5

B. 4.5×10^6

C. $7{,}800{,}000$

D. 4.68×10^6

24. The arithmetic mean of the ages of 30 pupils in a class is 15.3 years. One boy leaves the class and one girl is enrolled, and the new average age of 30 pupils in the class becomes 15.2 years. How much older is the boy than the girl?

A. 30 years

B. 6 years

C. 9 years

D. 3 years

25. A world congress of mathematician was held in Nice in 1970 with 800 people participating. There were 300 from Europe, 200 from America, 150 from Asia, 45 from Africa and 105 from Australia. Representing the above on a Pie Chart, the angle of the sector representing the participants from Asia is

A. 150°

B. 67.5°

C. 67°

D. 135°

26. Find the sum to infinity of the following sequence: $1, \frac{9}{10}, \frac{9}{10^2}, \frac{9}{10^3}$

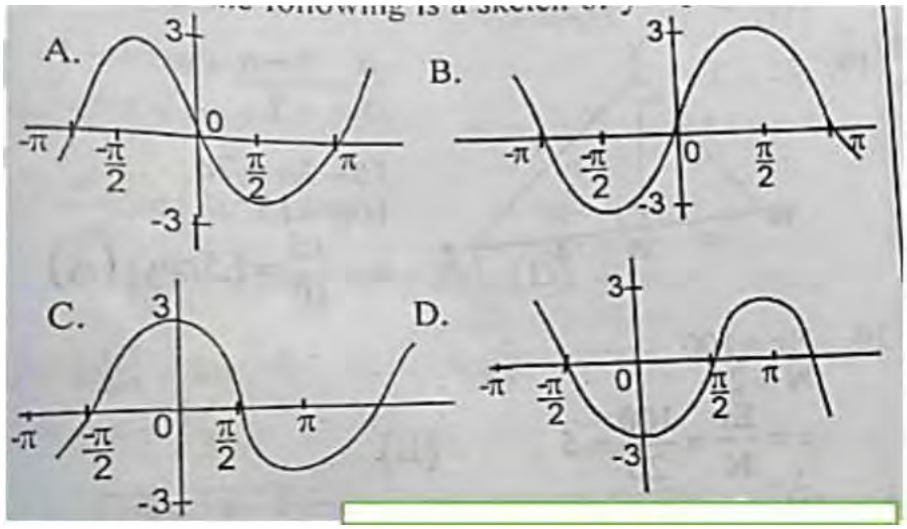
A. $\frac{1}{10}$

B. $\frac{9}{10}$

C. $\frac{10}{9}$

D. 10

27. Which of the following is a sketch of $y = 3\ sin\ x$?



28. Given that $log_a\ 2 = 0.693$ and $log_a\ 3 = \frac{1}{097}$, Find $log_a\ 13.5$

A. 1.404

B. 1.790

C. 2.598

D. 2.790

29. If the function $f(x) = x^3 + 2x^2 + qx - 6$ is divisible by the factor $x + 1$, find q.

A. −5

B. −2

C. 2

D. 5

30. What value of g will make the expression $4x^2 - 18xy + y + g$ a perfect square?

A. 9

B. $\frac{9y^2}{4}$

C. $81y^2$

D. $\frac{81y^2}{4}$

31. An arc of a circle subtends an angle 70° at the centre. If the radius of the circle is 6cm, calculate the area of the sector subtended by the given angle.

A. 22 cm2

B. 44 cm2

C. 66 cm2

D. 88 cm2

32. The angle of elevation of a building from a measuring instrument placed on the ground is 30°. If the building is 40m high, how far is the instrument from the foot of the building?

A. $\frac{20}{\sqrt{3}}$ m

B. $\frac{40}{\sqrt{3}}$ m

C. $20\sqrt{3}$ m

D. $40\sqrt{3}$ m

33. Integrate $\frac{1}{x} + \cos x$ respect to x

A. $-\frac{1}{x} + \sin x + k$

B. $\ln x + \sin x + k$

C. $\ln x - \sin x + k$

D. $-\frac{1}{8}\ sin\ x + k$

34. $\frac{dy}{dx}\cos(3x^2 - 2x)$ is equal to

A. $-\sin(6x - 2)$

B. $-\sin(3x^2 - 2)$

C. $(6x - 2)\ sin(3x^2 - 2x)$

D. $-(6x - 2)\ sin(3x^2 - 2x)$

35. If $log_8\ 10 = x$, evaluate $log_8\ 5$ in terms of x.

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

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

C. $\frac{x-1}{3}$

D. $\frac{x-1}{2}$

36. Simplify $\sqrt{\frac{0.0023\times750}{0.00345\times1.25}}$

A. 15

B. 20

C. 40

D. 75

37. Find the matrix T if ST = I where $S = \begin{pmatrix} -1 & 1 \\ 1 & -2 \end{pmatrix}$ and I is the identity index

A. $\begin{pmatrix} -2 & 1 \\ -1 & 1 \end{pmatrix}$

B. $\begin{pmatrix} -2 & -1 \\ -1 & -1 \end{pmatrix}$

C. $\begin{pmatrix} -1 & -1 \\ 0 & -1 \end{pmatrix}$

D. $\begin{pmatrix} -1 & 1 \\ 0 & 1 \end{pmatrix}$

38. The first term of a geometrical progression is twice its common ratio. Find the sum of the first two terms of the progression if its sum to infinity is 8.

A. 8⁄5

B. 8⁄3

C. 72⁄25

D. 56⁄9

39. In ΔMNO, MN = 6 units, MO= 4 units and NO =12 units. If the bisector of angle M meets NO at P, calculate NP.

A. 4.8 units

B. 7.2 units

C. 8.0 units

D. 18.0 units

40. Evaluate $\int_{\frac{\pi}{4}}(\sin x - \cos x)dx$

A. $\sqrt{2}+1$

B. $\sqrt{2}-1$

C. $-\sqrt{2}-1$

D. $-\sqrt{2}$

MATHEMATICS

(2016)

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1. Without using tables, evaluate $log_2 4 + log_4 2 - log_{25} 5$

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

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

C. 0

D. 2

2. Find the values of p for which the equation $x^2 - (p-2)x + 2p + 1 = 0$ has equal roots.

A. (0, 12)

B. (1, 2)

C. (21, 0)

D. (4, 5)

3. Solve the simultaneous equation $2x - 3y = 10, 10x - 6y = 5$

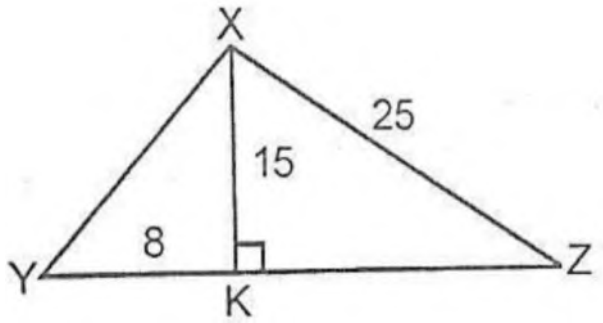
A. $= 2\frac{1}{2} y = 3\ \frac{1}{2}$

B. $= 3\frac{1}{2} y = 2\ \frac{1}{2}$

C. $= 2\frac{1}{4} y = 3$

D. $= 3\frac{1}{2} y = 2\ \frac{1}{5}$

4. In the ΔXYZ, $\hat{XKZ} = 90°$. $XK = 15\ cm$, $XZ = 25\ cm$ and $YK = 8\ cm$. Find the area of ΔXYZ.



A. 180 sq.cm

B. 20sq cm

C. 160sq. cm

D. 320 sq.cm

5. Simplify $3\frac{1}{3} - 1\frac{1}{4} \times \frac{2}{3} + 1\frac{2}{5}$

A. $2\frac{17}{30}$

B. $3\frac{9}{10}$

C. $4\frac{1}{10}$

D. $4\frac{11}{36}$

6. Factorize $1-(a-b)^2$

A. $(1-a-b)(1-a+b)$

B. $(1-a+b)(1+a-b)$

C. $(1-a+b)(1-a+b)$

D. $(1-a-b)(1+a-b)$

7. Find the range of value of x which satisfy the inequality $(\frac{x}{2}+\frac{x}{3}+\frac{x}{4})<1$

A. $x<\frac{12}{13}$

B. $x<13$

C. $x<3$

D. $x<\frac{13}{12}$

8. A crate of soft drinks contains 10 bottles of Coca-Cola, 8 of Fanta and 6 of Sprite, if one bottle is selected at random, what is the probability that it is NOT a Coca-Cola bottle?

A. $\frac{5}{12}$

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

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

D. $\frac{7}{12}$

9. The gradient of curve is 2 + 1 and the curve passes through point (2, 0). Find the equation of the curve.

A. $y=x^2+7x+9$

B. $y=x^2+7x-18$

C. $y=x^2+7x-9$

D. $y=x^2+14x+11$

10. Differentiate $(\cos q-\sin q)^2$ with respect to q

A. $-2\cos 2q$

B. $-2\sin 2q$

C. $1-2\cos 2q$

D. $1-2\sin 2q$

11. If $\tan q=\frac{5}{4}$, find $\sin 2q-\cos 2q$

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

B. $\frac{41}{9}$

C. $\frac{9}{41}$

D. 1

12. Find the value of x if the expression $kx^2 + x - 5x$ leaves a remainder 2 when it is divided by $2x - 1$

A. 10

B. 8

C. −10

D. −8

13. If $y = x^2 - x - 12$, find the range of values of x for which $y \geq 0$.

A. $x < -1$or $x > 4$

B. $x \leq -1$or $x \geq 4$

C. $-3 < x \leq 4$

D. $-3 \leq x \leq 4$

14. A man bought a second-hand photocopying machine for ₦34,000. He served it at a cost of ₦2,000 and then sold it at a profit of 15%. What was the selling price?

A. ₦37, 550

B. ₦40, 400

C. ₦41, 400

D. ₦42, 400

15. Find the radius of a sphere whose surface area is 154 cm^2

A. 7.00 cm

B. 3.50 cm

C. 3.00 cm

D. 1.75cm

16. The sum of the first n terms of the arithmetic progression 5, 11, 17, 23, 29, 35,… is

A. n(3n − 0)

B. n(3n + 2)

C. n(3n + 2.5)

D. n(3n + 5)

17. What value of x will make the function $x(4 - x)$ a maximum?

A. 4

B. 3

C. 2

D. 1

18. In how many ways can a delegation of 3 be chosen from 5 men and 3 women, if at least 1 man and 1 woman must be included?

A. 15

B. 28

C. 30

D. 45

19. Solve for x in $8x^{-2} = \frac{2}{25}$

A. 10

B. 4

C. 6

D. 8

20. A student measures a piece of rope and found that it was 1.26m long. If the actual length of the rope was 1.24 m, what was the percentage error in the measurement?

A. 0.40%

B. 0.01%

C. 0.25%

D. 0.80%

21. Rationalize $\frac{2\sqrt{3}+\sqrt{5}}{\sqrt{5}-\sqrt{3}}$

A. $\frac{3\sqrt{12}+11}{2}$

B. $\frac{3\sqrt{15}-11}{2}$

C. $3\sqrt{15} - 11$

D. $3\sqrt{15} + 11$

22. Solve the inequalities $-6 \leq 4 - 2 < 5 - x$

A. $-1 \leq x < 6$

B. $-1 < x \leq 5$

C. $-1 < x < 5$

D. $-1 \leq x \leq 6$

23. A cylindrical pipe 5cm long with radius 7m has one end open. What is the total surface area of the pipe?

A. 100 πm^2

B. 98 πm^2

C. 350 πm^2

D. 749 πm^2

24. Find the standard deviation of 2, 3, 5 and 6

A. $\sqrt{5}/_2$

B. √10

C. √6

D. $\sqrt{2}/_5$

25. Without using tables evaluate $(343)^{-\frac{1}{3}} \times (0.14)^{-1} \times (25)^{-\frac{1}{2}}$

A. 10

B. 12

C. 8

D. 7

26. Given that $log_4 (y-1) + log_4 (\frac{1}{2x}) = 1$ and $log_4 (y+1) + log_4 x = 2$, solve for x and y respectively.

A. 2, 3

B. 3, 2

C. −2, −3

D. −3, −2

27. When the expression $pm^2 + qm + 1$ is divided by $(m-1)$, it has a remainder 2 and when divided by $(m+1)$ the remainder is 4. Find p and q respectively.

A. 2, -1

B. -1, 2

C. 3, -2

D. -2, 3

28. Divide $2x^3 + 11x^2 + 17x + 6$ by $2x + 1$

A. $x^2 + 5x + 6$

B. $2x^2 + 5x + 6$

C. $2x^2 - 5x + 6$

D. $x^2 - 5x + 6$

⊗	p	q	r	s
p	r	p	r	p
q	p	q	r	s
r	r	r	r	r
s	q	s	r	q

29. The identity element with respect to the element shown in the table is

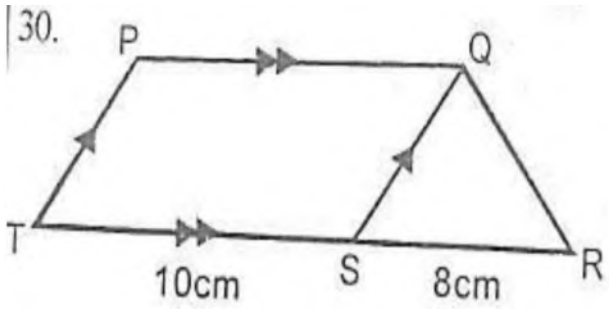
A. p

B. q

C. r

D. s

30. In the figure shown, PQST is a parallelogram and TSR is a straight line. If the area of ΔQRS 20 cm^2, find the area of the trapezium PQRT



A. 35 cm^2

B. 65 cm^2

C. 70 cm^2

D. 140 cm^2

31. The mid-point of the segment of the line $y = 12x + 15$ which lies between the x-axis and y-axis is

A. $(-\frac{2}{3}, \frac{3}{2})$

B. $(-\frac{2}{3}, \frac{3}{2})$

C. $(\frac{3}{8}, \frac{3}{2})$

D. $(-\frac{3}{6}, \frac{3}{2})$

32. Find the equation of the curve which passes through the point (2, 5) and whose gradient at any point is given by $6x - 5$

A. $6x^2 - 5x$

B. $6x^2 - 5x + 5$

C. $3x^2 - 5x - 5$

D. $3x^2 - 5x + 3$

33. $\frac{0.0001432}{1940000} = k \times 10^n$ where $1 \in k < 10$ and n is a whole number. The values of k and n are

A. 7.381 and -11

B. 2.34 and 10

C. 3.871 and 2

D. 7.831 and -11

34. Thirty boys and x girls sat for a test. The mean of the boys' scores and that of the girls were respectively 6 and 8. Find x if the total score was 468

A. 38

B. 24

C. 36

D. 22

35. Rationalize $\frac{5\sqrt{7}-7\sqrt{5}}{\sqrt{7}-\sqrt{5}}$

A. $-2\sqrt{35}$

B. $\sqrt{7} - 6\sqrt{5}$

C. $-\sqrt{35}$

D. $4\sqrt{7}$

36. If $2x + 3y = 1$ and $x - 2y = 11$, find $(x + y)$

A. 5

B. -3

C. 8

D. 2

37. Given that log 2 = 0.3010, log 7 = 0.8451. Evaluate log 112.

A. 2.5441

B. 2.0491

C. 2.1461

D. 3.1461

38. Simplify $(\sqrt[3]{640^3})^{-1}$

A. 80

B. 40

C. $1/40$

D. $1/80$

39. Find the value of p if the line joining (p, 4) and (6, -2) is perpendicular to the line joining (2, p) and (-1, 3)

A. 0

B. 3

C. 4

D. 6

40. Find the number of sides of a regular polygon whose interior angle is twice the exterior angle.

A. 2

B. 3

C. 6

D. 8

MATHEMATICS

S/N	2010
1	C
2	D
3	D
4	B
5	C
6	A
7	B
8	A
9	C
10	A
11	D
12	B
13	A
14	A
15	B
16	C
17	D
18	B
19	B
20	A
21	C
22	A
23	A
24	A
25	D
26	B
27	A
28	B
29	C
30	A
31	B
32	D
33	A
34	A
35	A
36	B
37	B
38	A
39	D
40	B

S/N	2011
1	A
2	D
3	A
4	C
5	B
6	B
7	B
8	B
9	A
10	D
11	D
12	A
13	D
14	C
15	D
16	B
17	B
18	B
19	B
20	B
21	B
22	B
23	A
24	A
25	B
26	B
27	B
28	A
29	B
30	D
31	A
32	B
33	C
34	B
35	D
36	A
37	B
38	C
39	A
40	B

S/N	2012
1	D
2	D
3	D
4	B
5	B
6	D
7	C
8	B
9	A
10	A
11	D
12	C
13	C
14	A
15	C
16	B
17	C
18	D
19	B
20	B
21	A
22	C
23	C
24	A
25	D
26	B
27	C
28	B
29	D
30	B
31	C
32	B
33	B
34	C
35	B
36	D
37	B
38	D
39	A
40	D

S/N	2013
1	B
2	A
3	C
4	C
5	B
6	B
7	C
8	C
9	B
10	B
11	D
12	D
13	A
14	D
15	A
16	B
17	C
18	A
19	D
20	C
21	D
22	D
23	D
24	B
25	B
26	B
27	D
28	B
29	A
30	D
31	C
32	C
33	D
34	B
35	B
36	B
37	B
38	D
39	D
40	D

S/N	2014
1	D
2	D
3	D
4	D
5	C
6	A
7	B
8	D
9	D
10	A
11	B
12	C
13	D
14	B
15	C
16	B
17	B
18	D
19	B
20	C
21	D
22	A
23	A
24	D
25	B
26	C
27	C
28	C
29	A
30	B
31	D
32	B
33	B
34	D
35	B
36	C
37	A
38	A
39	C
40	D

S/N	2015
1	A
2	C
3	B
4	C
5	D
6	B
7	D
8	C
9	D
10	C
11	C
12	B
13	C
14	A
15	C
16	B
17	D
18	C
19	A
20	B
21	D
22	C
23	D
24	D
25	B
26	D
27	D
28	C
29	A
30	D
31	A
32	D
33	B
34	D
35	C
36	B
37	C
38	B
39	B
40	B

S/N	2016
1	A
2	A
3	A
4	B
5	B
6	B
7	A
8	D
9	C
10	A
11	A
12	C
13	B
14	C
15	B
16	B
17	C
18	D
19	A
20	A
21	A
22	B
23	D
24	A
25	A
26	C
27	A
28	A
29	C
30	C
31	B
32	D
33	A
34	C
35	C
36	D
37	B
38	C
39	B
40	C

SKY-HIGH CONCEPTS AND GLOBAL ICT

SKY-HIGH SOFTWARE

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- MOCK CBT Exams
- Entrance Exams
- School Termly Exams
- Interview CBT

2. Results Management Software

3. Financial Management Software

4. Database Management Software

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- Post-UTME
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