THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Technology for Self Reliance

Mathematics Questions

1. There are 8 green balls, 4 blue balls and 3 white balls in a box. Then 1 green and 1 blue balls are taken from the box and put away. What is the probability that a blue ball is selected at random from the box?

   A. 3/13 B. 2/13 C. 4/15 D.3/15

2. Find r, if $7r7_8 = 618_9$.

   A. 3 B. 2 C. 6 D. 5

3. Simplify $\left(\frac{3}{4} of \frac{4}{9} \div 9\frac{1}{2}\right) \div 1\frac{5}{19}$

   A. $^1/_5$ B. $^1/_4$ C. $^1/_{36}$ D. $^1/_{25}$

4. A student measures a piece of rope and found it was $1.27m$ long. If the actual length of the rope was $1.25m$, what was the percentage error in the measurement?

   A. 1.6% B. 1.0% C. 0.8% D. 0.16%

5. At what rate will the interest on ₦500 increase to ₦25 in 5 years reckoning in simple interest?

   A. 2% B. 1% C. 4% D. 5%

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

   A. 12: 3: 2 B. 12: 15: 4 C. 9: 10: 15 D. 9: 12: 15

7. Evaluate $\left(\frac{243}{32}\right)^{\frac{-1}{5}} \times 2^{-2}$.

   A. 3 B. 6 C. $\frac{1}{6}$ D. $\frac{1}{3}$

8. Given that $\log 2 = 0.3010$, $\log 7 = 0.8451$. Evaluate $\log 224$

   A. 2.1461 B. 2.3501 C. 2.0491 D. 3.1461

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

   A. $\frac{3\sqrt{35}-\sqrt{17}}{2}$ B. $3\sqrt{35}+\sqrt{17}$ C. $3\sqrt{35}-\sqrt{17}$ D. $\frac{3\sqrt{35}+\sqrt{17}}{2}$

10. Express the product of 0.31 and 0.34 in standard form

    A. 1.0541×10^{-1} B. 1.0541×10^{-2} C. 1.0541×10^{-3} D. 1.0541×10^{-4}

11 In a survey of 60 newspaper readers, 49 read Nation and 30 read Punch, how many read both papers?

A. 10 B. 5 C. 20 D. 15

12. Make R the subject of the formula if $P = \frac{M}{5}(X + R^2) + 2$

A. $\sqrt{\frac{5P+10+XM}{M}}$ B. $\sqrt{\frac{5P+10-XM}{M}}$ C. $\sqrt{\frac{5P-10-XM}{M}}$

D. $\sqrt{\frac{5P-10+XM}{M}}$

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

A. $2y - 3x$ B. $2y + 3x$ C. $-2y - 3x$

D. $-2y + 3x$

14. Factorize completely $\frac{x^3+2x^2-15x}{2x^2-18}$

A. $\frac{x(x+5)}{2(x-3)}$ B. $\frac{x(x+5)}{2(x+3)}$ C. $\frac{x(x-5)}{2(x-3)}$ D. $\frac{x(x+5)}{2x+9}$

15. Solve for x and y if x-y=3 and $x^2 - y^2 = 9$

A. (-3,0) B. (0,-3) C. (3,0) D. (0,3)

16. If y varies directly as the square root of x and y=3 when x=25. Calculate y when x=100.

A. 12 B. 3 C. 5 D. 6

17. If x is inversely proportional to y and $x = 3\frac{1}{2}$ when y=2, find x if y=4.

A. $1\frac{1}{4}$ B. $2\frac{3}{4}$ C. $1\frac{3}{4}$ D. $2\frac{1}{4}$

18. For what range of values of x is $\frac{1}{3}x + \frac{1}{4} > \frac{1}{4}x + \frac{1}{2}$?

A. $x < 3$ B. $x > 3$ C. $x > -3$ D. $x < -3$

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

A. $-1 < x < 5$ B. $-1 \leq x \leq 6$ C. $-1 \leq x < 6$

D. $-1 < x \leq 5$

20. Find the sum to infinity of the following series

$0.2+0.02+0.002+0.0002+\cdots$

A. $\frac{1}{4}$ B. $\frac{2}{9}$ C. $\frac{2}{11}$ D. $\frac{2}{7}$

21. The 3rd term of an arithmetic progression is -8 and the 7th term is -28. Find the 10th term of the progression.

A. -43 B. -164 C. 164 D. 44

22. If $x * y = x - y^2$, find the value of $(2 * 3) * 5$

A. -25 B. 25 C. -32 D. 32

23. If p and q a.e two nonzero numbers and 16(p+q)=(16+p)/q, which of the following must be true.

A. p<1 B. p=16 C. q<1 D. q=16

24. If $\begin{vmatrix} x & 4 \\ 3 & 7 \end{vmatrix} = 9$, find the value of x.

A. 4 B. 5 C. 2 D. 3

25. Evaluate $\begin{vmatrix} 3 & 0 & 6 \\ 5 & 7 & 4 \\ 9 & 0 & 2 \end{vmatrix}$

A. -336 B. 336 C. 420 D. -420

26. A rectangular picture 6cm by 8cm is enclosed by a frame (1/2) wide. Calculate the area of the frame.

A. 15 sq cm B. 20 sq cm C. 13 sq cm D. 17 sq cm

27. The area of $3\frac{7}{8}$ and $1\frac{1}{3}$ is less than the difference between $\frac{3}{8}$ and $1\frac{2}{3}$ by

A. $3\frac{11}{12}$ B. $5\frac{1}{4}$ C. $1\frac{1}{2}$ D. $8\frac{1}{8}$

28. 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. $2x^3 + 2yx^2 + 10xy + 10y^2 + 31y + 5x^2 + 2x + 10$

29. The sum of the progression $1 + x + x^2 + x^3 + \cdots$ is equal

A. 1/(1-x) B. 1/(1+x) C. 1/(x-1) D. 1/x

30. If $x^2 + 4 = 0$, then x=

A. 4 B. -2 C. none of these D. 2

31. Five years ago, a father was 3 times as old as his son. Now, their combined ages amount to 110 years. Thus, the present age of the father is

A. 75 years B. 60 years C. 98 years D. 81 years

32. If $y = 2x^2 + 9x - 35$, find the range of values for which y < 0.

A. $-7 \leq x < 5$ B. $-5 \leq x < 7$ C. $-\left(\frac{7}{2}\right) < x \leq 5$

D. $-7 < x < (5/2)$

33. Mother reduced the quantity of food bought for the family by 10% when she found that the cost of living had increased by 15%. Thus the fractional increase in the family food bill is now

A. 1/12 B. 6/35 C. 19/300 D. 7/200

34. Given that $a * b = ab + b + a$ and $a^{\circ}b = 1 + b + a$. Find $(a * b)^{\circ}(a * c)$, if a, b, c are real numbers.

A. ac+ab+bc+b+c+1 B. ac+ab+a+c+2

C. ac+ab+2a+b+c+1 D. ac+ab+bc+b+c+2

35. If the four interior angles of a quadrilateral are $(P + 10)°, (P - 30)°$, $(2P - 45)°$, and $(P + 35)°$, then P is

A. 78° B. 125° C. 135° D. 60°

36. Simplify $(a - b)/(a + b) - (a + b)/(a - b)$

A. $4ab/(a^2 - b^2)$ B. $-4ab/(a^2 - b^2)$

C. $2ab/(a^2 - b^2)$ D. $-2ab/(a^2 - b^2)$

37. The minimum point on the curve $y = x^2 - 6x + 5$ is at

A. (1, 5) B. (3,-4) C. (2, 3) D. (3, 4)

38. If $3x - \left(\frac{1}{4}\right) > \left(\frac{1}{4}\right) - x$, then the interval of values of x is

A. $x > (1/3)$ B. $x < (1/3)$
C. $x < (9/16)$ D. $x > (9/16)$

39. A man runs a distance of 9km/h for the first 4km and then 2km/h for the rest of the distance. The whole run takes him one hour. His average speed for the first 4km is

A. 6km/h B. 8km/h C. 9km/h D. 11km/h

40. In a soccer competition in one season, a club had scored the following goals: 2, 0, 3, 3, 2, 1, 4, 0, 0, 5, 1, 0, 2, 2, 1, 3, 1, 4, 1, and 1. The mean, median and mode are respectively.

A. 1, 1.8, and 1.5 B. 1.8, 1.5 and 1 C. 1.8, 1 and 1.5

D. 1.5, 1 and 1.8

41. If $sec^2\emptyset + tan^2\emptyset = 3$, then angle $\emptyset$ is equal to

A. $20°$ B. $60°$ C. $45°$ D. $90°$

42. The set of values of x and y which satisfies the equations $x^2 - y - 1 = 0$ and $y - 2x + 2 = 0$ is

A. 1, 0 B. 1, 1 C. 2, 2 D. 0, 2

43. Two triangles have the same area if

A. two sides in one triangle are equal to two sides in the other.

B. three sides in one triangle are equal to three sides in the other.

C. two angles in one triangle are equal to two angles in the other.

D three angles in one triangle are equal to three angles in the other.

44. If $25^{x-1} = 64(5/2)^6$, then x has the value

A. 7 B. 4 C. 32 D 5

45. In a circle of radius 10cm, a chord of length 10cm is xcm from its centre. What is x.

A. $10\sqrt{2}$ B. $5\sqrt{3}$ C. $10\sqrt{3}$ D. $5\sqrt{2}$

46. The smallest number such that when it is divided by 8 has a remainder of 6 and when it is divided by 9 has a remainder of 7 is

A. 50 B. 70 C. 80 D. 60

47 Evaluate $\int_0^{\pi/4} sec^2\theta d\theta$.

A. $\frac{1}{4}$ B. $\frac{\pi}{2}$ C. 1 D. $\frac{\pi}{4}$

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

A. ₦74 B. ₦74.52 C. ₦75 D. ₦75.52

49. Find the roots of the equation $10x^2 - 13x - 3 = 0$

A. x=3/5 or -1/2 B. x=-1/5 or 3/2 C. x=3/10 or 1

D. x=-3/10 or 1

50. The median of the set of numbers; 4, 9, 4, 13, 7, 14, 10, 7 is

A. 13 B. 7/4 C. 7/2 D. 10

51. List all the integer values of x satisfying the inequality $-1 < 2x - 5 \leq 5$.

A. 2, 3, 4, 5 B. 2, 5 C. 3, 4, 5 D. 2, 3, 4

52. The ratio of the areas of similar triangles is necessarily equal to

A. the ratio of the corresponding sides.

B. the ratio of the square on corresponding sides.

C. the ratio of the corresponding heights of the triangles.

D. half the ratio of the corresponding heights of the triangles.

53. A man and his wife went to buy article costing ₦400. The woman had 10% of the cost and the man 40% of the remainder. How much did they have altogether.

A. ₦216 B. ₦200 C. ₦184 D. ₦144

54. Simplify $log_{10}8/log_{10}4$

A. $log_{10}2$ B. $log_8 4$ C. 3/2 D. 2

55. Three number are connected by the relationship y=4x/9 + 1 and z=4y/9 + 1. If x=99, find z.

A. $6\frac{1}{3}$ B. 20 C. 21 D. $176\frac{4}{9}$

56. In a school there are 35 students in class 2A and 40 in class 2B. The mean score for class 2A in a Mathematics examination is 60.00 and that for 2B in the paper is 52.5. Find, to one place of decimals, the mean of the combined classes.

A. 56.5 B. 56.0 C. 56.3 D. 56.2

57. A set of data contains a total of 130 items which are divided into six groups for display on a pie chart. If one of the groups contains 26 items then the sector representing this group on the pie chart contains an angle $x°$ at the centre of the circle where x is

A. 3 B. 60 C. 70 D. 72

58. In triangle FGH, $\angle G = 90°, \angle H = 60°$, while triangle XYZ, $\angle X = 60°$, and $\angle Y = 30°$. From ∠XYZ, write down the ratio equal to |FG|/|FH|.

A. |YZ|/|ZX| B. |YX|/|YZ| C. |ZX|/|YZ|

D. |YZ|/|YX|

59. A pentagon has four of its sides equal. If the size of the fifth angle is $60°$ find the size of each of the four equal angles.

A. $60°$ B. $108°$ C. $120°$ D. $150°$

60. The result of dividing $(x^a/x^b)^{a+b}$ by $(x^{a+b}/x^{a-b})^{a^2/b}$ is

A. x^{a^2} B. x^{b^2} C. $1/x^{(a^2+b^2)}$ D. $x^{(a^2-b^2)}$

61. What will be the value of k so that the quadratic equation $kx^2 - 4x + 1 = 0$ has equal roots?

A. 2 B. 3 C. 4 D. 8

62. If it is given that $5^{x+1} + 5^x = 150$ then the value of x is equal to

A. 2 B. 1 C. 3 D. 4

63. Solve the system of equations $2^{x+y} = 32, 3^{y-x} = 27$.

A. (1, 4) B. (2, 3) C. (1, 2) D. (-1, -2)

64. Simplify the given expression $\sqrt{[\frac{1-cosx}{1+cosx}]}$

A. (1-cosx)/sinx B. 1-cosx C. sinx D. (1+cosx)/sinx

65. Find the area of the curved surface of a cone whose base radius is 6cm and whose height is 8cm. (Take $\pi = {}^{22}/_{7}$).

A. 1320 cm^2 B. 188.57 cm^2 C. 188 cm^2

D. 188.08 cm^2

66. The expression $x^3 - 4x^2 + cx + d$ such that x+1 is its factor, and its value is 1 when x is -2. Find c and d.

A. c=4 and d=9 B. c=-4 and d=9

C. c=-20 and d=-15 D. c=20 and d=-15

67. If a function is defined by $f(x+1) = 3x^2 - x + 4$. Find f(0).

A. 4 B. 6 C. 0 D. 8

68. A cylindrical motor of height 12cm has uniform thickness of 2cm. If the diameter of its outer cross-section is 10cm, find the volume of the constituent material. (Take $\pi = {}^{22}/_{7}$).

A. $\frac{6600}{7} cm^3$ B. $\frac{270}{7} cm^3$ C. $\frac{660}{7} cm^3$ D. $\frac{1980}{7} cm^3$

69. A cuboid has a diagonal of length 9cm and a square base of side 4cm. What is its height?

A. 9 cm B. $\sqrt{65}cm$ C. $4\sqrt{2}cm$ D. 7 cm

70. If x varies inversely as y, and y varies directly as the square root of z, and z varies directly as $1/w^2$, write down in words how x varies with w.

A. x varies inversely as w^2 B. x varies directly as w^2

C x varies directly as w D. x varies inversely as w

71. Simplify $sin^2x/(1+cosx) + sin^2x/(1-cosx)$

A. 2 B. $sinx$ C. 1 D. sin^2x

72. From two points X and Y, 8cm apart, and in line with a pole, the angle of elevation of the top of the pole are $30°$ and $60°$ respectively. Find the height of the pole, assuming that X, Y and the foot of the pole are on the same horizontal plane and X and Y are on the same side of the pole.

A. 4m B. $(8\sqrt{3})/3$m C. $4\sqrt{3}$m D. $8\sqrt{3}$m

73. A bag contains 3 apples, 4 oranges and 3 bananas. What is the probability of selecting a banana and then an apple?

A. 9/100 B. 9/10 C. 1/10 D. 2/3

74. Evaluate ${}^{n}P_{r}/{}^{n-1}P_{r-1}$

A. n B. n-1 C. n-2 D. 2n

75. The chance of three independent events X, Y, Z occurring are ½, 2/3, ¼ respectively. What are the chances of Y and Z only occurring.

A. 1/8 B. 1/24 C. 1/12 D. 1/4

76. If $P = \begin{pmatrix} 2 & -1 \\ 3 & 3 \end{pmatrix}$, what is P^{-1}?

A. $\begin{pmatrix} \frac{-1}{3} & \frac{-1}{9} \\ \frac{-1}{3} & \frac{2}{9} \end{pmatrix}$ B. $\begin{pmatrix} \frac{1}{3} & \frac{1}{9} \\ \frac{-1}{3} & \frac{2}{9} \end{pmatrix}$ C. $\begin{pmatrix} \frac{-1}{3} & \frac{1}{9} \\ \frac{1}{3} & \frac{2}{9} \end{pmatrix}$ D. $\begin{pmatrix} \frac{-1}{3} & \frac{1}{9} \\ \frac{-1}{3} & \frac{2}{9} \end{pmatrix}$

77. The interior angles of a quadrilateral are $(x+20°)$, $(2x-45°)$, $(x-15°)$ and $(2x+10°)$. Find the value of the least interior angle.

A. $63°$ B. $88°$ C. $102°$ D. $112°$

78. If the two smaller sides of right angled triangle are 8cm and 9cm, find its area.

A. $10cm^2$ B. $12cm^2$ C. $36cm^2$ D. $24cm^2$

79. An arc subtends an angle $60°$ at the centre of circle of radius 6cm. Calculate the area of the sector formed.($\pi = \frac{22}{7}$)

A. $\frac{132}{7}$ B. $\frac{122}{7}$ C. $\frac{112}{7}$ D. $\frac{102}{7}$

80. A cylindrical pipe 40m long with radius 7m has one end open. What is the total surface area of the pipe?

A. 609π B. $658\ \pi$ C. $560\ \pi$ D. $98\ \pi$

81 What is the locus of points equidistant from points P(1,4) and Q(2,5).

A. y=-x-6 B. y=x+6 C. y=x-6 D. y=-x+6

82. Find the distance between the points $(\frac{2}{3},\frac{2}{3})$ and $(\frac{-1}{3},\frac{-1}{3})$

A. 1 B. 0 C. $\sqrt{3}$ D. $\sqrt{2}$

83. Find the gradient of the line passing through the points p(1,2) and q(2,5)

A. 3 B. 2 C. 5 D. 4

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

A. 4y+x+10=0 B. 4y-x-10=0 C. 4y-x+10=0

D. 4y+x-10=0

85. If $\cot\theta = \frac{7}{15}$, where θ is acute, find $\tan\theta$.

A. $\frac{15}{8}$ B. $\frac{15}{7}$ C. $\frac{8}{17}$ D. $\frac{15}{17}$

86. If $y = (2x-1)^3$, find $\frac{dy}{dx}$

A. 6(2x-1) B. 3(2x-1) C. $6(2x-1)^2$ D. $3(2x-1)^2$

87. If y=xcosx, find $\frac{dy}{dx}$

A. sinx-xcosx B. cosx-xsinx C. cosx-sinx

D. sinx+cosx

88. At what value of x does the function $y = -3x + 2x + x^2$ attain a minimum value?

A.. 1 B. -4 C. 4 D. 1

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

A. $11\frac{1}{2}$ B. $12\frac{1}{4}$ C. $10\frac{1}{4}$ D. $11\frac{1}{4}$

90. Find $\int (cosx + 2)dx$

90. Find $\int(cosx + 2)dx$

A. sinx+2x+k B. -sinx+2x+k C. sinx+x^2+k

D. -sinx+x^2+k

91

Marks	2	3	4	5	6	7	8
No of Students	4	2	5	2	4	1	3

From the table above if the pass mark is 5, how many students failed the test?

A. 7 B. 6 C. 11 D. 2

92. If three unbiased coins are tossed, find the probability that they are all tails

A. $\frac{1}{6}$ B. $\frac{1}{3}$ C. $\frac{1}{9}$ D. $\frac{1}{8}$

93. In how many ways can a committee of 3 women and 4 men be chosen from 6 men and 5 women

A. 250 B. 25 C. 50 D. 100

94. Find the standard deviation of 2,4,5 and 6

A. $\sqrt{\frac{7}{2}}$ B. $\sqrt{\frac{2}{7}}$ C. $\sqrt{7}$ D. $\sqrt{14}$

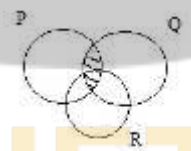
95. Find the equation of a line parallel to y=-3x+2 passing through (1,3)

A. y+3x-6=0 B. y-3x-6=0 C. y-3x+6=0

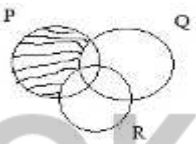
D. y+3x+6=0

96. Which of the Venn diagrams below represents $P \cap Q' \cap R'$

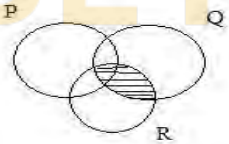
A



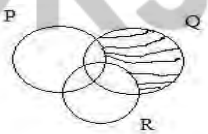
B.



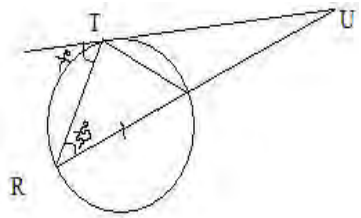
C.



D.

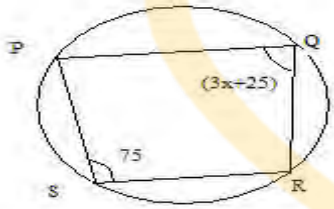


97



From the diagram above, find x

A. 55° B. 65° C. 50° D. 75°



98. From the cyclic quadrilateral PQRS above find the value of x.

A. 30° B. 32° C. 60° D. 62°

99. If a and b are the roots of $x^2 - 5x + 7 = 0$, find $a^2 + b^2$

A. 11 B. 25 C. -14 D. 39

100 Find, correct to three significant figures, the value of $\sqrt{41830}$

A. 205 B. 647 C. 2050 D. 6470

101 Which of the following is not a factor of $12^4 - 5^4$?

A. 169 B. 13 C. 17 D. 49

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

A. ₦74 B. ₦76 C. ₦75.54 D. ₦75

103. The median of the set of numbers 4,9,4,13,7,14,10,17 is

A. 9.5 B. 7 C. 10 D. 8.5

104. List all the integer values of x satisfying the inequality -1<2x-5=5

A. 2,4,5 B. 1,4,5 C. 4,5,6 D. 3,4,5

105. A solid cylinder of radius 3cm has a total surface area of $36\pi cm^2$. Find its height.

A. 2cm B. 3cm C. 4cm D. 5cm

106. Simplify $\frac{log10^8}{log10^4}$

A. 1.5 B. 7 C. 3 D. 2

107. Write down the number 0.0052048 correct to three significant figures.

A. 0.005 B. 0.0052 C. 0.00521 D. 0.00520

108. A man and his wife went to buy an article costing #400.The woman had 10% of the cost and the man 40% of the remainder .How much did they have altogether?

A. ₦174 B. ₦164 C. ₦184 D. ₦194

109. A pentagon has four of its angles equal. If the size of the fifth angle is 60°,find the size of each of the four equal angles.

A. 120 B. 100 C. 110 D. 130

110. If it is given that $5^{x+1} + 5^x = 150$,then the value of x is equal to

A. 0 B. 1 C. 1.5 D. 2

111. Simplify the given expression $\sqrt{\frac{1-cosx}{1+cosx}}$

A. $\frac{1-cosx}{sinx}$ B. 1-cosx C. 1+sinx D. 1+cosx

112. Write the decimal number 39 to base 2.

A. 110111 B. 100111 C. 111000 <C> 110111

113. Find the smallest number by which 252 can be multiplied to obtain a perfect square

A. 2 B. 3 C. 7 D. 5

114. Find the reciprocal of $\frac{\frac{2}{3}}{\frac{1}{2}+\frac{1}{3}}$

A. $\frac{4}{5}$ B. $\frac{5}{4}$ C. $\frac{2}{3}$ D. $\frac{6}{7}$

115. Divide the L.C.M of 48,64 and 80 by their H.C.F.

A. 60 B. 30 C. 48 D. 20

116 The ages of Sola and Akin differ by 6 and the product of their ages is 187.Write their ages in the form (x,y),where x>y.

A. (11,17) B. (11,16) C. (23,17) D. (17,11)

117. If $5^{(x+2y)} = 5$ and $4^{(x+3y)} = 16$,find $3^{(x+y)}$

A. 1 B. 0 C. 2 D. 3

118. Find the values of x which satisfy the equation $16^x - 5 * 4^x + 4 = 0$

A. 0 and -1 B. 1 and 2 C. 0 and 2 D. 0 and 1

119. Factorise $x^2 + 2a + ax + 2x$

A. (x+2a)(x+1) B. (x-2a)(x+1) C. (x+2a)(x-1)

D. (x+2)(x+a)

120. An open rectangular box externally measures 4m x3m x4m.Find the cost of painting the box externally if its cost #2.00 to paint one square metre

A. ₦116.00 B. ₦113.00 C. ₦112.00 <C> #136.00

121. Find the probability that a number selected at random from 40 to 50 is a prime

A. $\frac{3}{10}$ B. $\frac{3}{11}$ C. $\frac{3}{13}$ D. $\frac{4}{11}$

122. If x varies directly as y^3 and x=2 when y=1,find x when y=5.

A. 200 B. 350 C. 450 D. 250

123 If Musa scored 75 in Biology instead of 57,his average mark in four subjects would have been 60.What was his total mark?

A. 220 B. 222 C. 322 D. 122

124 A man kept 6 black,5 brown and 7 purple shirts in a drawer. What is the probability of his picking a purple shirt with his eyes closed?

A. $\frac{7}{17}$ B. $\frac{7}{19}$ C. $\frac{7}{20}$ D. $\frac{7}{18}$

125 Evaluate $212_3 - 121_3 + 222_3$

A. 1121_3 B. 1023_3 C. 1020_3 D. 2020_3

126. Simplify $\frac{0.0324 * 0.00064}{0.48 * 0.012}$

A. 0.0036 B. 0.036 C. 0.36 D. 3.6

127. Find n if $log2^4 + log2^7 - log2^n = 1$

A. 24 B. 13 C. 42 D. 14

128. At what points does the straight line y=2x+1 intersect the curve $y=2x^2+5x-1$?

A. (-2,-3) and (0.5,1) B. (-2,-3) and (0.5,2)

C. (2,3) and (0.5,2) D. (1,2) and (3,4)

129. If $\cos\theta = \frac{a}{b}$, find $1+tan^2\theta$

A. $\frac{a^2}{b^2}$ B. $\frac{b^2}{a^2}$ C. $1+a^2$ D. $1+b^2$

130. If P=18,Q=21,R=-6,and S=-4,calculate $\frac{(P-Q)^3}{R^3}+S^2$

A. $\frac{11}{216}$ B. $\frac{11}{316}$ C. $\frac{11}{416}$ D. $\frac{11}{116}$

131 Sola deposited #150.00 in the bank. At the end of 5years,the simple interest on the principal was #55.00.At what rate per annum was the interest paid?

A. 6.33% B. 8.33% C. 7.32% D. 7.33%

132. Find the gradient of the line passing through the points (-2,0) and (0,-4)

A. 2 B. -2 C. 3 D. 4

133. At what value of x is the function $y=x^2-2x-3$ *minimum?*

A. 2 B. -2 C. -1 D. 1

134. Solve the equation (x-2)(x-3)=12

A. 1,6 B. 3,6 C. -1,6 D. 1, -6

135. Find the two values of y which satisfy the simultaneous equations 3x+y=8,x^2+xy=6

A. 1and 5 B. 2 and 5 C. 0 and 5 D. -1 and 5

136. Find the sum of the 20 terms in an arithmetic progression whose first term is 7 and the last term is 117

A. 239 B. 1240 C. 1340 D. 1440

137. The angles of a quadrilateral are 5x-30,4x+60,60-x and 3x+61.Find the smallest of these angles.

A. $60-x$ B. 4x+60 C. 5x-30 D. 3x+61

138. If g(x)=x^2+3x+4,find g(x+1)-g(x).

A. 2(x+1) B. 2(x-2) C. x+2 D. 2(x+2)

139. Find the positive number n, such that thrice its square is equal to twelve times the number.

A. 1 B. 4 C. -4 D. -1

140 The area of a square is 144sq cm. Find the length of its diagonal.

A. $12\sqrt{2}$ cm B. 12cm C. 13cm D. 14cm

141. Simplify $\frac{\sqrt{12}-\sqrt{3}}{\sqrt{12}+\sqrt{3}}$

A. 3 B. 0 C. 16 D. $\frac{1}{3}$

142. If S=(x:x^2=9,x>4),then S is equal to

A. 0 B. {0} C. ϕ D. {ϕ}

143. Express the product of 0.0014 and 0.011 in standard form.

A. 1.54×10^{-5} B. 1.54×10^{-4} C. 1.54×10^{-3}

D. 1.54×10^{-2}

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

A. $\frac{81y}{4}$ B. $\frac{9y^2}{4}$ C. $\frac{81y^2}{4}$ D. $\frac{81y^3}{4}$

145. If x*y=x+y-xy, find x when (x*2)+(x*3)=68

A. -21 B. 21 C. 12 D. -12

146. Determine x+y if $\begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -1 \\ 8 \end{pmatrix}$

A. 3 B. 4 C. 7 D. 12

147. Find the minimum value of $x^2 - 3x + 2$ for all real values of x

A. -0.75 B. 0.75 C. -0.25 D. 1.25

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

A. -5 B. 5 C. -2 D. 2

149. Find the gradient of the curve y=2x(x-3) at x=1

A. 2 B. -2 C. 1 D. -1

150. Integrate $\frac{1}{x}$+cosx with respect to x

A. lnx+sinx+k B. lnx-sinx+k C. lnx-cosx+k D. lnx-cosx-k

151. Find the value of K if $\frac{K}{\sqrt{3}}=\sqrt{3}$

A. 3 B. -3 C. 9 D. -9

152. If $\frac{{}^{6}C_{r}}{{}^{6}P_{r}}=\frac{1}{6}$, find the value of r.

A. 1 B. 3 C. 3.5 D. 2

153 How many two-digits numbers can be formed from the digits 0,1,2,3 if a digit can be repeated and no number may begin with 0?

A. 4 B. 6 C. 13 D. 12

154. The length s of the sides of a right-angled triangle are xcm,(3x-1)cm and (3x+1).Find x.

A. 12 B. 11 C. 10 D. 9

155. If y=xsinx, find $\frac{dy}{dx}$ when x=$\frac{\pi}{2}$.

A. -1 B. 0 C. 1 D. 2

156. P(-6,1) and Q(6,6) are the two ends of the diameter of a given circle. Calculate the radius.

A. 6 units B. 7.5 units C. 6.5 units D. 7 units

157. Find the rate of change of the volume of v of a sphere with respect to its radius r when r=1.

A. 7π B. 9π C. 10π D. 8π

158. If ${}^{6}P_{r}=6$,find the value of ${}^{6}P_{r+1}$

A. 33 b. 30 C. 32 D. 31

159. Teams A and B are involved in a game of football. What is the probability that the game ends in a draw?

A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{1}{4}$ D. $\frac{2}{3}$

160. The range of the data k+2,k-3,k+4,k-2,k-5,k+3,k-1 and k+6 is

A. 10 B. 11 C. 12 D. 13

161. If A=$\begin{pmatrix}2 & 1\\ -3 & 0\end{pmatrix}$ and I is a 2x2 unit matrix, evaluate $A^2-2A+4I$

A. $\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ B. $\begin{pmatrix}1 & 0\\ 3 & 4\end{pmatrix}$ C. $\begin{pmatrix}1 & 5\\ 3 & 4\end{pmatrix}$ D. $\begin{pmatrix}1 & 7\\ 3 & 4\end{pmatrix}$

162. If the 9th term of an A.P. is five times the 5th term, find the relationship between a and d.

A. a+2d=0 B. a-d=0 C. a+2d-1=0 D. a+3d=0

163 Find the maximum value of y in the equation $y=1-2x-3x^2$

A. $\frac{4}{3}$ B. $\frac{4}{5}$ C. $\frac{3}{5}$ D. $\frac{3}{7}$

164. The binary operation * is defined on the set of integers p and q by p*q=pq+p+q. Find 2*(3*4).

A. 69 B. 49 C. 59 D. 79

165. Given that $Q=\begin{pmatrix}6 & 0\\ 4 & 5\end{pmatrix}$ and $Q+P=\begin{pmatrix}7 & -2\\ 6 & 8\end{pmatrix}$ evaluate determinant of Q+2P

A. 120 B. 123 C. 100 D. 90

166. Find the tangent of the acute angle between the lines 2x+y=3 and 3x-2y=5

A. 1.25 B. 1.33 C. 2.75 D. -1.75

167. If the maximum value of $y=1+hx-3x^2$ is 13, find h

A. 12 B. 13 C. 14 D. 11

168. If the standard deviation of the set of numbers 3,6,x,7,5 is $\sqrt{2}$,find the least possible value of x.

A. 2 B. 3 C. 5 D. 6

169. Evaluate $\int_{-2}^{1}(x-1)^2dx$

A. 11 B. 9 C. 10 D. 12

170 Find the area bounded by the curve y=x(2-x),the x-axis, x=0 and x=2.

A. 1.25sq.units B. 1.33sq.units C. 0.33sq.units

D. 2.33sq.units

171. A trader realizes $10x-x^2$naira profit from the sale of x bags of corn. How many bags will give him the maximum profit?

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

172. If a and b are the roots of the equation $3x^2+5x-2=0$,find the value of $\frac{1}{a}+\frac{1}{b}$

A. -2.5 B. 0.4 C. 1.5 D. 2.5

173. If P$344_6-23P2_6=2PP2_6$,find the value of digit P.

A. 4 B. 5 C. 6 D. 7

174. Find the minimum value of the function $f(\theta)=\frac{2}{3-\cos\theta}$ for $0 \leq \theta \leq 2\pi$

A. 0.50 B. 1.67 C. 0.67 D. 2.67

175. X and Y are two events. The probability of X or Y is 0.7 and the probability of X is 0.4.If X and Y are independent, find the probability of Y.

A. 0.2 B. 0.4 C. 0.5 D. 0.3

176. An equilateral triangle of side 3cm is inscribed in a circle. Find the radius of the circle.

A. 1.0cm B. 2.0cm C. 3.0cm D. 0.7cm

177. In a class of 40 students,32 offer Mathematics,24offer Physics and 4 offer neither Mathematics nor Physics. How many offer both Mathematics and Physics?

A. 16 B. 21 C. 19 D. 20

178 If $\frac{9^{2x-1}}{27^{x-1}}=1$, find the value of x.

A. 3 B. 5 C. 6 D. 7

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

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

180. A cinema hall contains a certain number of people. If 22.5% are children, 47.5% are men and 84 are women, find the number of men in the hall.

A. 133 B. 132 C. 130 D. 123

181. Find the value of p, if the line which passes through (-1,-p) and (-2p,2) is parallel to the line 2y+8x-17=0.

A. $\frac{6}{5}$ B. $\frac{6}{7}$ C. $\frac{6}{11}$ D. $\frac{7}{11}$

182. An arc of a circle subtends an angle of 30° on the circumference of a circle of radius 21cm.Find the length of the arc.

A. 11cm B. 22cm C. 66cm D. 44cm

183. Find the remainder when $3x^3+5x^2-11x+4$ is divided by x+3.

A. -1 B. 2 C. 4 D. 1

184. The nth terms of two sequences are $Q_n = 3x2^{n-2}$ and $U_m = 3x2^{2m-3}$. Find the product of Q_2 and U_2.

A. 18 B. 16 C. 6 D. 3

185. If the operation * on the set of integers is defined by p*q=$\sqrt{pq}$, find the value of 4*(8*32).

A. 16 B. 8 C. 6 D. 18

186. Find the sum to infinity of the series $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \ldots$

A. 1 B. 0.25 C. 0.75 D. 1.75

187. A man 40m from the foot of a tower observes the angle of elevation of the tower to be 30°. Determine the height of the tower.

A. $\frac{40\sqrt{3}}{3}m$ B. 40m C. 20m D. $40\sqrt{3}$m

188. A cliff on the bank of a river is 300m high. If the angle of depression of a point on the opposite side of the river is 60°, find the width of the river.

A. 100m B. 150m C. $100\sqrt{3}$ cm D. 200m

189. The mean of a set of six numbers is 60.If the mean of the first five is 50, find the sixth number in the set.

A. 100 B. 120 C. 105 D. 110

190. Make r the subject of the formula $\frac{x}{a+r} = \frac{a}{r}$

A. $\frac{a}{a+r}$ B. $\frac{a^2}{x-a}$ C. $\frac{a^2}{x+a}$ <C> $\frac{a}{a-r}$

191 The inverse of the function f(x)=3x+4 is

A. $\frac{x-4}{3}$ B. $\frac{x+4}{3}$ C. $\frac{3}{x-4}$ D. $\frac{3}{x+4}$

192. If $\frac{dy}{dx} = 2x - 3$ and y=3 when x=0, find y in terms of x

A. $x^2 - 3x - 3$ B. $x^2 - 3x + 3$ C. $x^2 + 3x - 3$

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

193. A circle with a radius 5cm has its radius increasing at the rate of 0.2cm/s.What will be the corresponding increase in the area?

A. 3π B. 4π C. 2π D. 5π

194. Find the range of values of x for which $\frac{x+2}{4} - \frac{2x-3}{3} < 4$

A. x<6 B. x>6 C. x<-6 D. x>-6

195. If -2 is the solution of the equation 2x+1-3c=2c+3x-7, find the value of c

A. 2 B. -2 C. 3 D. -3

196. The sum of the interior angles of a regular polygon is 1800°.Calculate the size of one exterior angle of the polygon.

A. 45° B. 60° C. 30° D. 90°

197. Find the simple interest rate percent per annum at which #1,000 accumulates to #1,240 in 3 years.

A. 8% B. 7% C. 6% D. 5%

198. Three consecutive positive integers k, l and m are such that l^2=3(k+m).Find the value of m.

A. 4 B. 5 C. 6 D. 7

199. Find the value of x if $\frac{\sqrt{2}}{x+\sqrt{2}}=\frac{1}{x-\sqrt{2}}$

A. $3\sqrt{2}$-4 B. $3\sqrt{2}$+4 <C> $3\sqrt{2}$-3 <C> $3\sqrt{2}$+3

200. The expression ax^2+bx+c equals 5 at x=1.If its derivative is 2x+1, what are the values of a,b,c respectively.

A. 1,3,1 B. 1,-3,1 C. 1,1,3 D. 1,3,-1

201. If $\tan\theta=\frac{5}{4}$, $find\ sin^2\theta-cos^2\theta$

A. $\frac{41}{9}$ B. $\frac{41}{3}$ C. $\frac{9}{41}$ D. $\frac{19}{41}$

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

A. -2 B. 3 C. 2 D. 4

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

A. 50 B. 30 C. 45 D. 35

204. A man invested #5000 for 9 months at 4%. What is the simple interest?

A. ₦220 B. ₦130 C. ₦150 D. ₦250

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

A. 1 B. 2 C. 4 D. 31

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

A. $\frac{2}{3}$ B. $\frac{1}{2}$ C. $\frac{8}{9}$ D. $\frac{1}{3}$

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

A. 2 B. 1 C. 0 D. 3

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

A. $\frac{1-\sqrt{5}}{2}$ B. $\frac{1-\sqrt{5}}{3}$ C. $\frac{1+\sqrt{5}}{4}$ D. $\frac{1-\sqrt{5}}{4}$

209. Simplify $\left(\sqrt{2}+\frac{1}{\sqrt{3}}\right)\left(\sqrt{2}-\frac{1}{\sqrt{3}}\right)$.

A. $\frac{7}{3}$ B. $\frac{5}{3}$ C. $\frac{5}{2}$ D. $\frac{3}{2}$

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

A. 49 B. 170 C. 210 D. 21

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

A. x+3 B. 2x-1 C. 2x+1 D. x-3

212. 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)

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

A. -9, 3 B. 9, -3 C. 3, -9 D. -3, -9

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

A. 27 B. 20.25 C. 36 D. 2.25

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

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

A. $x \leq 2$ B. $x \leq -2$ C. $x \leq -1$ D. $x \geq -1$

217. Solve the inequality $x^2+2x > 15$.

A. x>3 or x<-5 B. x<-3 or x>5 C. -5<x<3 C. x<3 or x>5

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

A. 513 B. 505 C. 433 D. 635

219. 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. 54 C. 64 D. 62

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

A. $\frac{2}{3}$ B. $\frac{1}{3}$ C. -1 D. 2

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

A. -6 B. 6 C. 12 D. -12

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

A. 45 B. 15 C. 55 D. 25

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

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

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

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

A. 120^0 B. 150^0 C. 30^0 D. 180^0

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

A. $56cm^2$ B. $98cm^2$ C. $49cm^2$ D. $28cm^2$

226. A chord of a circle of radius 7cm is 5cm from the centre of the circle. What is the length of the chord?

A. $4\sqrt{6}$cm A B. $3\sqrt{6}$cm C. $6\sqrt{6}$cm D. $2\sqrt{6}$cm

227. A solid metal cube of side 3cm is placed in a rectangular tank of dimensions 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. $27\ cm^3$

228. 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

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

A (2, 10) B. (2, 8) C. (2, 12) D. (2, 6)

230 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-2x+18=0

D. 5y+2x-2=0

231 In a right angled triangle, if $\tan\theta = \frac{3}{4}$. What is $\cos\theta - \sin\theta$?

A. $\frac{1}{4}$ B. $\frac{3}{5}$ C. $\frac{1}{5}$ D. $\frac{2}{5}$

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

A. 195^0 B. 135^0 C. 225^0 D. 045^0

233 The derivative of (2x+1)(3x+1) is

A. 12x+1 B. 6x+5 C. 6x+1 D. 12x+5

234 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

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

A. 2 B. 5 C. 6 D. 3

236 Find $\int cos4xdx$.

A. $\frac{3}{4}sin4x + k$ B. $-\frac{1}{4}sin4x + k$ C. $\frac{1}{4}sin4x + k$

D. $-\frac{3}{4}sin4x + k$

237 The sum of four consecutive integers is 34. Find the least of these numbers.

A. 6 B. 8 C. 7 D. 5

No.	0	1	2	3	4	5
Frequency	1	4	3	8	2	5

238 find the median and range of the data respectively.

A. (8, 5) B. (3, 5) C. (5, 8) D. (5, 3)

Class Interval	0-2	3-5	6-8	9-11
Frequency	1	4	3	8

239 Find the mode of the above distribution.

A. 9 B. 8 C. 10 D. 7

Class Interval	3-5	6-8	9-11
Frequency	2	2	2

240 Find the standard deviation of the above distribution

A. $\sqrt{3}$ B. $\sqrt{5}$ C. $\sqrt{7}$ D. $\sqrt{2}$

241 In how many ways can the letters of the word ELATION be arranged?

A. 6! B. 5! C. 8! D. 7!

242 In how many ways can five people sit round a circular table?

A. 60 B. 24 C. 12 D. 120

243 Find the probability that a number picked at random from the set {43, 44, 45,..., 60} is a prime number.

A. $\frac{2}{3}$ B. $\frac{2}{9}$ C. $\frac{1}{3}$ D. $\frac{7}{9}$

244 In a class of 60 students, 30 offer Physics and 40 offer Chemistry. If a student is picked at random from the class, what is the probability that the student offer both Physics and Chemistry?

A. $\frac{1}{3}$ B. $\frac{1}{4}$ C. $\frac{1}{2}$ D. $\frac{1}{6}$

245 Convert 72_6 to a number in base three.

A. 2211 B. 2121 C. 1212 D. 1122

246 Simply $\frac{2\frac{2}{3}\times 1\frac{1}{2}}{4\frac{4}{5}}$

A. $1\frac{2}{4}$ B. $1\frac{1}{6}$ C. $\frac{5}{6}$ D. $\frac{4}{5}$

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

A. 2.30 B. 2.31 C. 2.32 D. 2.33

248 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

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

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

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

A. $\frac{1}{3}$ B. $\frac{1}{9}$ C. $\frac{1}{27}$ D. $\frac{1}{81}$

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

A. $2\sqrt{6}$ B. $4\sqrt{6}$ C. $8\sqrt{6}$ D. $16\sqrt{6}$

252 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 $P \cap Q$.

A. {3} B. {2,3} C. {2,3,5} D. {1,2}

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

A. 1 B. 2 C. 3 D. 4

254 Make n the subject of the fomula if $w = \frac{v(2+cn)}{1-cn}$

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

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

255 Find the remainder when $2x^3 - 11x^2 + 18x - 1$ is divided by $x + 3$.

A. -871 B. -781 C. -187 D. -178

256 Solve for x and y in the equation 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. $x = -2, y = 0$

257 If y varies directly as $\sqrt{n}$ and $y = 4$ when $n = 4$, find y when $n = 1\frac{7}{9}$.

A. $\sqrt{17}$ B. $\frac{4}{3}$ C. $\frac{8}{3}$ D. $\frac{2}{3}$

258 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

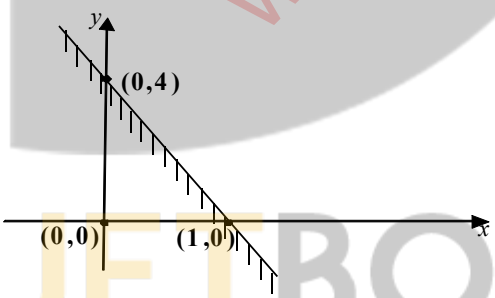
259 The value of y for which $\frac{1}{5}y + \frac{1}{5} < \frac{1}{2}y + \frac{2}{5}$ is

A. $y > \frac{2}{3}$ B. $y < \frac{2}{3}$ C. $y > -\frac{2}{3}$ D. $y < -\frac{2}{3}$

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

A. $2 < m < 5$ B. $-3 < m < 4$ C. $3 < m < 4$

D. $-4 < m < 3$



261 The shaded region above is represented by the equation.

A. $y \leq 4x + 2$ B. $y \geq 4x + 2$ C. $y \leq -4x + 4$

D. $y \leq 4x + 4$

262 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

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

A. $-\frac{1}{5}$ B. $-\frac{1}{4}$ C. $-\frac{1}{3}$ D. $-\frac{1}{2}$

264 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

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

A. $-\frac{4}{5}$ B. $-\frac{2}{5}$ C. 4 D. 5

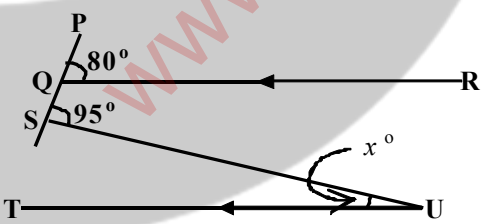
266 If $\begin{vmatrix} 5 & 3 \\ x & 2 \end{vmatrix} = \begin{vmatrix} 3 & 5 \\ 4 & 5 \end{vmatrix}$, find the value of x

A. 3 B. 4 C. 5 D. 7

267 Given that I_3 is a unit matrix of order 3, find $|I_3|$

A. -1 B. 0 C. 1 D. 2

268



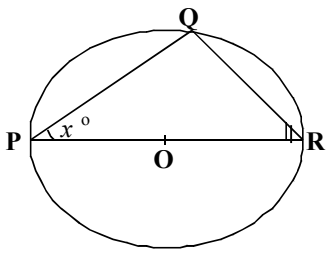
In the diagram above, **QR//TU**, $\angle$ **PQR=80°** and $\angle$ **PSU=95°**. Calculate $\angle$ **SUT**.

A. 15° B. 25° C. 30° D. 80°

269 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°

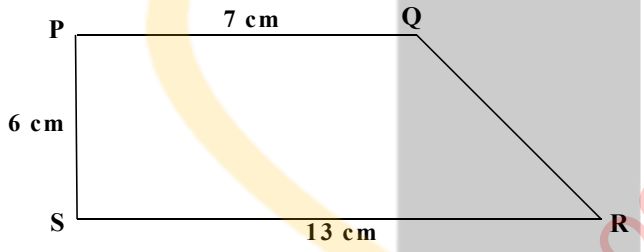
270



In the diagram above, **PQR** is a circle centre **O.** If $\angle$ **QPR** is x^o, find **QRP**.

A. x^o B. $(90-x)^o$ C. $(90+x)^o$ D. $(180-x)^o$

271



Find the area of the trapezium above.

A. 91 cm^2 B. 78 cm^2 C. 60 cm^2 D. 19 cm^2

272 A circular arc subtends angle 150^o at the centre of a circle of radius 12cm. Calculate the area of the sector of the arc.

A. 30π cm^2 B. 60π cm^2 C. 120π cm^2 D. 150π cm^2

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

A. 3.92 cm^3 B. 2.13 cm^3 C. 1.97 cm^3 D. 1.62 cm^3

274 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 $7x-13y+8=0$.

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

A. $\frac{1}{2}$ B. $\frac{2}{5}$ C. $-\frac{4}{7}$ D. $-\frac{2}{3}$

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

A. $\sqrt{13}$ B. $3\sqrt{2}$ C. $\sqrt{26}$ D. $10\sqrt{5}$

277 Find the equation of the lines through the points (-2, 1) and $(-\frac{1}{2}, 4)$

A. $y = 2x - 3$ B. $y = 2x + 5$ C. $y = 3x - 2$

D. $y = 2x + 1$

278 If angle θ is 135^{o}, evaluate $\cos\theta$.

A. $\frac{1}{2}$ B. $\frac{\sqrt{2}}{2}$ C. $\frac{-\sqrt{2}}{2}$ D. $-\frac{1}{2}$

279 A man stands on a tree 150 cm high and sees a boat at an angle of depression of 74^{o}. Find the distance of the boat from the base of the tree.

A. 52 cm B. 43 cm C. 40 cm D. 15 cm

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

A. $y = 2x - \frac{1}{x^{2}}$ B. $2x + x^{2}$ C. $2x - x^{2}$

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

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

A. $\sin x$ B. $-\sin x$ C. $\tan x$ D. $-\tan x$

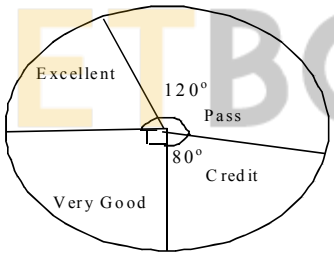
282 Evaluate $\int_{1}^{2} (x^{2} - 4x)dx$.

A. $\frac{11}{3}$ B. $\frac{3}{11}$ C. $\frac{-3}{11}$ D. $\frac{-11}{3}$

283 Evaluate $\int_{0}^{\frac{\pi}{4}} (\sec^{2}\theta)d\theta$.

A. 1 B. 2 C. 3 D. 4

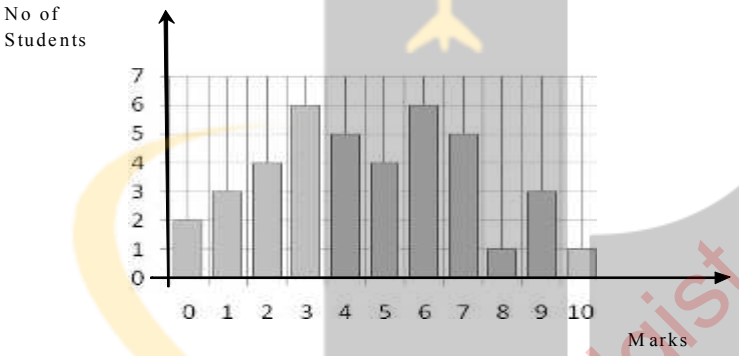
284



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

A. 12 B. 9 C. 8 D. 7

285



The bar chart above shows the distribution of marks in a class test. If the pass mark is 5, what percentage of the students failed the test?

A. 10% B. 20% C. 50% D. 60%

286 The mean of seven numbers is 96. If the eight number is added, the mean becomes 112. Find the eight number.

A. 126 B. 180 C. 216 D. 224

287 Find the median of 2,3,7,3,4,5,8,9,9,4,5,3,4,2,4 and 5

A. 9 B. 8 C. 7 D. 4

288 Find the range of 4,9,6,3,2,8,10 and 11.

A. 11 B. 9 C. 8 D. 4

289 Find the standard deviation of 2,3,8, 10 and 12.

A. 3.9 B. 4.9 C. 5.9 D. 6.9

290 Evaluate ${}^{n+1}C_{n-2}$ If $n=15$.

A. 3630 B. 3360 C. 1120 D. 560

291 In how many ways can the letters of the word TOTALITY be arranged?

A. 6720 B. 6270 C. 6207 D. 6027

292 The probability that a student passes a physics test is $\frac{2}{3}$, If he takes three physics test, what is the probability that he passes two of the test.

A. $\frac{4}{9}$ B. $\frac{6}{9}$ C. $\frac{4}{27}$ D. $\frac{2}{27}$

293 The probability that a man and his wife live for 80 years are $\frac{2}{3}$ and $\frac{3}{5}$ respectively. Find the probability that at least one of them will live up to 80 years.

A. $\frac{2}{15}$ B. $\frac{3}{15}$ C. $\frac{7}{15}$ D. $\frac{13}{15}$