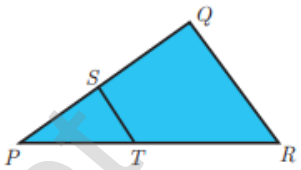
V.M.G.R.R SRI SARADA SAKTHI MAT. HR. SEC. SCHOOL

MATHS

Standard: X **ONEWORDS TEST** **MARKS: 125**

1. In a given figure ST ∥ QR, PS = 2 cm and SQ = 3 cm. Then the ratio of the area of ΔPQR to the area of ΔPST is



(A) 25 : 4 (B) 25 : 7
(C) 25 : 11 (D) 25 : 13

2. (2, 1) is the point of intersection of two lines.
(A) x − y – 3 =0; 3x – y − 7 = 0 (B) x + y = 3; 3x + y = 7
(C) 3x + y = 3; x + y = 7 (D) x + 3y – 3 = 0; x - y – 7 = 0

3. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is
(A) 60π cm^2 (B) 68 π cm^2 (C) 120 π cm^2 (D) 136 π cm^2

4. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
(A) 2025 (B) 5220 (C) 5025 (D) 2520

5. A purse contains 10 notes of ₹2000, 15 notes of ₹500, and 25 notes of ₹200. One note is drawn at random. What is the probability that the note is either a ₹500 note or ₹200 note?
(A) $\frac{1}{5}$ (B) $\frac{3}{10}$ (C) $\frac{2}{3}$ (D) $\frac{4}{5}$

6. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that a = bq + r, where r must satisfy
(A) 1 < r < b (B) 0 < r < b (C) 0 ≤ r < b (D) 0 < r ≤ b

7. A system of three linear equations in three variables is inconsistent if their planes
(A) intersect only at a point (B) intersect in a line
(C) coincides with each other (D) do not intersect

8. Graph of a linear equation is a _____
(A) straight line (B) circle (C) parabola (D) hyperbola

9. Two persons are standing 'x' metres apart from each other and the height of the first person is double that of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the shorter person (in metres) is
(A) $\sqrt{2}x$ (B) $\frac{x}{2\sqrt{2}}$ (C) $\frac{x}{\sqrt{2}}$ (D) 2x

10. If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when
(A) ∠B = ∠E (B) ∠A = ∠D (C) ∠B = ∠D (D) ∠A = ∠F

11. Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?
(A) 13 m (B) 14 m (C) 15 m (D) 12.8 m

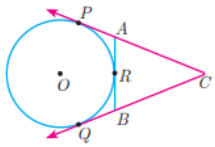
12. The values of a and b if $4x^4 – 24x^3 + 76x^2 + ax + b$ is a perfect square are
(A) 100, 120 (B) 10, 12 (C) -120, 100 (D) 12, 10

13. If A = {1, 2}, B = {1, 2, 3, 4}, C = {5, 6} and D = {5, 6, 7, 8} then state which of the following statement is true.
(A) (A × C) ⊂ (B × D) (B) (B × D) ⊂ (A × C)
(C) (A × B) ⊂ (A × D) (D) (D × A) ⊂ (B × A)

14. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_6 is

(A) 3 (B) 5 (C) 8 (D) 11

15. In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If CP = 11 cm and BC = 7 cm, then the length of BR is



(A) 6 cm (B) 5 cm (C) 8 cm (D) 4 cm

16. The straight line given by the equation x = 11 is

(A) parallel to X axis (B) parallel to Y axis

(C) passing through the origin (D) passing through the point (0,11)

17. $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives

(A) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (B) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$

(C) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (D) $\frac{x^2+10}{(x^2-25)(x+1)}$

18. The angle of elevation of a cloud from a point h metres above a lake is β. The angle of depression of its reflection in the lake is 45°. The height of location of the cloud from the lake is

(A) $\frac{h\,(1+\tan\beta)}{1-\tan\beta}$ (B) $\frac{h\,(1-\tan\beta)}{1+\tan\beta}$ (C) h tan(45° − β) (D) none of these

19. A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y axis. The path travelled by the man is

(A) x = 10 (B) y = 10 (C) x = 0 (D) y = 0

20. Let n(A) = m and n(B) = n then the total number of non-empty relations that can be defined from A to B is

(A) m^n (B) n^m (C) $2^{mn} - 1$ (D) 2^{mn}

21. The solution of the system x + y – 3z = 6, - 7y + 7z = 7, 3z = 9 is

(A) x = 1, y = 2, z = 3 (B) x = - 1, y = 2, z = 3

(C) x = - 1, y = − 2, z = 3 (D) x = 1, y = - 2, z = 3

22. The two tangents from an external points P to a circle with centre at O are PA and PB. If ∠APB = 70° then the value of ∠AOB is

(A) 100° (B) 110° (C) 120° (D) 130°

23. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

(A) 12 cm (B) 10 cm (C) 13 cm (D) 5 cm

24. In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is

(A) $5600\pi cm^3$ (B) $1120\pi cm^3$ (C) $56\,\pi cm^3$ (D) $3600\,\pi cm^3$

25. An A.P. consists of 31 terms. If its 16^{th} term is m, then the sum of all the terms of this A.P. is

(A) 16 m (B) 62 m (C) 31 m (D) $\frac{31}{2}$ m

26. A tangent is perpendicular to the radius at the

(A) centre (B) point of contact (C) infinity (D) chord

27. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

(A) $4\,\pi r^2$ sq. units (B) $6\,\pi r^2$ sq. units (C) $3\,\pi r^2$ sq. units (D) $8\,\pi r^2$ sq. units

28. If A is a point on the Y axis whose ordinate is 8 and B is a point on the X axis whose abscissae is 5 then the equation of the line AB is

(A) 8x + 5y = 40 (B) 8x - 5y = 40 (C) x = 8 (D) y = 5

29. The sum of the exponents of the prime factors in the prime factorization of 1729 is

(A) 1 (B) 2 (C) 3 (D) 4

30. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

(A) 5 (B) 10 (C) 15 (D) 20

31. If {(a, 8), (6, b)} represents an identify function, then the value of a and b are respectively
(A) (8, 6) (B) (8, 8) (C) (6, 8) (D) (6, 6)

32. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is
(A) 0 (B) 1 (C) 0 or 1 (D) 2

33. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
(A) 0, 1, 8 (B) 1, 4, 8 (C) 0, 1, 3 (D) 1, 3, 5

34. In ΔLMN, ∠L = 60°, ∠M = 50°. If ΔLMN ~ ΔPQR then the value of ∠R is
(A) 40° (B) 70° (C) 30° (D) 110°

35. Which of the following should be added to make $x^4 + 64$ a perfect square
(A) $4x^2$ (B) $16x^2$ (C) $8x^2$ (D) $-8x^2$

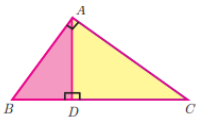
36. If $\sin\theta + \cos\theta = a$ and $\sec\theta + cosec\,\theta = b$, then the value of $b(a^2 - 1)$ is equal to
(A) 2a (B) 3a (C) 0 (D) 2ab

37. The solution of $(2x - 1)^2 = 9$ is equal to
(A) – 1 (B) 2 (C) – 1, 2 (D) None of these

38. The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1 : 2$ then $r_2 : r_1$ is
(A) 1 : 3 (B) 1 : 2 (C) 2 : 1 (D) 3 : 1

39. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is
(A) $\frac{q}{p+q+r}$ (B) $\frac{p}{p+q+r}$ (C) $\frac{p+q}{p+q+r}$ (D) $\frac{p+r}{p+q+r}$

40. In the adjacent figure ∠ BAC = 90° and AD ⊥ BC then



(A) $BD \cdot CD = BC^2$ (B) $AB \cdot AC = BC^2$
(C) $BD \cdot CD = AD^2$ (D) $AB \cdot AC = AD^2$

41. If the HCF of 65 and 117 is expressible in the form of 65m - 117, then the value of m is
(A) 4 (B) 2 (C) 1 (D) 3

42. Which of the following is incorrect?
(A) P (A) > 1 (B) $0 \le P(A) \le 1$ (C) $P(\emptyset) = 0$ (D) $P(A) + P(\bar{A}) = 1$

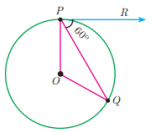
43. A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then, the volume of the frustum is
(A) 3328π cm^3 (B) 3228π cm^3 (C) 3240π cm^3 (D) 3340π cm^3

44. A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is
(A) 3x cm (B) x cm (C) 4x cm (D) 2x cm

45. If (x – 6) is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
(A) 3 (B) 5 (C) 6 (D) 8

46. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.
(A) 4551 (B) 10091 (C) 7881 (D) 13531

47. In figure if PR is tangent to the circle at P and O is the centre of the circle, then ∠POQ is



(A) 120° (B) 100° (C) 110° (D) 90°

48. The area of triangle formed by the points (−5, 0), (0, −5) and (5, 0) is
(A) 0 sq.units (B) 25 sq.units (C) 5 sq.units (D) none of these

49. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$ is
(A) $\frac{1}{24}$ (B) $\frac{1}{27}$ (C) $\frac{2}{3}$ (D) $\frac{1}{81}$

50. Consider four straight lines (i) l_1 ; 3y = 4x + 5 (ii) l_2 ; 4y = 3x + 1 (iii) l_3 ; 4y = 3x + 7 (iv) l_4; 4x + 3y = 2
Which of the following statement is true ?

(A) l_1 and l_2 are perpendicular (B) l_1 and l_4 are parallel
(C) l_2 and l_4 are perpendicular (D) l_2 and l_3 are parallel

51. The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is

(A) $\frac{4}{3}\pi$ (B) $\frac{10}{3}\pi$ (C) 5π (D) $\frac{20}{3}\pi$

52. If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$, then q, p, r are in

(A) A.P (B) G.P (C) Both A.P and G.P (D) None of these

53. The slope of the line joining (12, 3), (4, a) is $\frac{1}{8}$. The value of 'a' is

(A) 1 (B) 4 (C) -5 (D) 2

54. The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is

(A) $\frac{9\pi h^2}{8}$ sq.units (B) $24\pi h^2$ sq.units (C) $\frac{8\pi h^2}{9}$ sq.units (D) $\frac{56\pi h^2}{9}$ sq.units

55. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is

(A) 2:1 (B) 1:2 (C) 4:1 (D) 1:4

56. If a letter is chosen at random from the English alphabets {a, b,..., z}, then the probability that the letter chosen precedes x

(A) $\frac{12}{13}$ (B) $\frac{1}{13}$ (C) $\frac{23}{26}$ (D) $\frac{3}{26}$

57. A straight line has equation 8y + 4x = 21. Which of the following is true

(A) The slope is 0.5 and the y intercept is 2.6
(B) The slope is 5 and the y intercept is 1.6
(C) The slope is 0.5 and the y intercept is 1.6
(D) The slope is 5 and the y intercept is 2.6

58. If the ordered pairs (a + 2, 4) and (5, 2a + b) are equal then (a, b) is

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

59. When proving that a quadrilateral is a parallelogram by using slopes you must find

(A) The slopes of two sides (B) The slopes of two pair of opposite sides
(C) The lengths of all sides (D) Both the lengths and slopes of two sides

60. A = {a, b, p}, B = {2, 3}, C = {p, q, r, s} then n [(A ∪ C) × B] is

(A) 8 (B) 20 (C) 12 (D) 16

61. If in ΔABC, DE ∥ BC. AB = 3.6 cm, AC = 2.4 cm and AD = 2.1 cm then the length of AE is

(A) 1.4 cm (B) 1.8 cm (C) 1.2 cm (D) 1.05 cm

62. The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point 'b' metres above the first, the depression of the foot of the pole is 60°. The height of the pole (in metres) is equal to

(A) $\sqrt{3}$ b (B) $\frac{b}{3}$ (C) $\frac{b}{3}$ (D) $\frac{b}{\sqrt{3}}$

63. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \cdots + 2^0$ which of the following is true?

(A) B is 2^{64} more than A (B) A and B are equal
(C) B is larger than A by 1 (D) A is larger than B by 1

64. If 6 times of 6th term of an A.P. is equal to 7 times the 7^{th} term, then the 13^{th} term of the A.P. is

(A) 0 (B) 6 (C) 7 (D) 13

65. A shuttle cock used for playing badminton has the shape of the combination of

(A) a cylinder and a sphere (B) a hemisphere and a cone

(C) a sphere and a cone (D) frustum of a cone and a hemisphere

66. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

(A) $\frac{3}{10}$ (B) $\frac{7}{10}$ (C) $\frac{3}{9}$ (D) $\frac{7}{9}$

67. If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is

(A) 3 (B) 2 (C) 4 (D) 8

68. $y^2 + \frac{1}{y^2}$ is not equal to

(A) $\frac{y^4+1}{y^2}$ (B) $(y + \frac{1}{y})^2$ (C) $(y - \frac{1}{y})^2 + 2$(D) $(y + \frac{1}{y})^2 - 2$

69. The range of the relation R = {(x, x^2) | 2 is a prime number less than 13} is

(A) {2, 3,5,7} (B) {2,3,5,7,11}

(C) {1,4,9,25,49,121} (D) {4,9,25,49,121}

70. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

(A) 1:2 (B) 1:4 (C) 1:6 (D) 1:8

71. Find the matrix X if $2X + \begin{pmatrix}1 & 3\\5 & 7\end{pmatrix} = \begin{pmatrix}5 & 7\\9 & 5\end{pmatrix}$

(A) $\begin{pmatrix}-2 & -2\\2 & -1\end{pmatrix}$ (B) $\begin{pmatrix}2 & 2\\2 & -1\end{pmatrix}$ (C) $\begin{pmatrix}1 & 2\\2 & 2\end{pmatrix}$ (D) $\begin{pmatrix}2 & 1\\2 & 2\end{pmatrix}$

72. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is

(A) $\frac{9y}{7}$ (B) $\frac{9y^2}{21y-21}$ (C) $\frac{21y^2-42y+21}{3y^3}$ (D) $\frac{7(y^2-2y+1)}{y^2}$

73. If the radius of the base of a cone is tripled and the height is doubled then the volume is

(A) made 6 times (B) made 18 times (C) made 12 times (D) unchanged

74. The point of intersection of 3x – y = 4 and x + y = 8 is

(A) (5, 3) (B) (2, 4) (C) (3, 5) (D) (4, 4)

75. How many tangents can be drawn to the circle from an exterior point?

(A) one (B) two (C) infinite (D) zero

76. In a ΔABC, AD is the bisector of ΔBAC . If AB = 8 cm, BD = 6 cm and DC = 3 cm. The length of the side AC is

(A) 6 cm (B) 4 cm (C) 3 cm (D) 8 cm

77. When proving that a quadrilateral is a trapezium, it is necessary to show

(A) Two sides are parallel (B) Two parallel and two non-parallel sides

(C) Opposite sides are parallel (D) All sides are of equal length

78. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is

(A) $\sqrt{3}$ (B) $-\sqrt{3}$ (C) $\frac{1}{\sqrt{3}}$ (D) 0

79. If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is

(A) 3 (B) 6 (C) 9 (D) 12

80. The total surface area of a hemi-sphere is how much times the square of its radius.

(A) π (B) 4 π (C) 3 π (D) 2 π

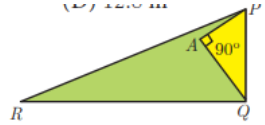
81. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is

(A) 1:2:3 (B) 2:1:3 (C) 1:3:2 (D) 3:1:2

82. In the given figure, PR = 26 cm, QR = 24 cm, ∠PAQ = 90°, PA=6 cm and QA = 8 cm. Find ∠PQR

(A) 80° (B) 85°

(C) 75° (D) 90°



83. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

(A) $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ (B) $16\left|\frac{y^2}{x^2z^4}\right|$ (C) $\frac{16}{5}\left|\frac{y}{xz^2}\right|$ (D) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

84. In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120?

(A) 6 (B) 7 (C) 8 (D) 9

85. A tower is 60 m heigh. Its shadow is x metres shorter when the sun's altitude is 45° than when it has been 30°, then x is equal to

(A) 41.92 m (B) 43.92 m (C) 43 m (D) 45.6 m

86. The slope of the line which is perpendicular to a line joining the points (0, 0) and (–8, 8) is

(A) –1 (B) 1 (C) $\frac{1}{3}$ (D) -8

87. If the mean and coefficient of variation of a data are 4 and 87.5% then the standard deviation is

(A) 3.5 (B) 3 (C) 4.5 (D) 2.5

88. The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° respectively. The height of the multistoried building and the distance between two buildings (in metres) is

(A) 20, $10\sqrt{3}$ (B) 30, $5\sqrt{3}$ (C) 20, 10 (D) 30, $10\sqrt{3}$

89. If ΔABC is an isosceles triangle with ∠C = 90° and AC = 5 cm, then AB is

(A) 2.5 cm (B) 5 cm (C) 10 cm (D) $5\sqrt{2}$ cm

90. If $5x = \sec\theta \ and \ \frac{5}{x} = \tan\theta$ then $x^2 - \frac{1}{x^2}$ is equal to

(A) 25 (B) 1/25 (C) 5 (D) 1

91. $\tan\theta \ cosec^2\theta - \tan\theta$ is

(A) sec θ (B) $\cot^2\theta$ (C) sin θ (D) cot θ

92. Which of the following can be calculated from the given matrices A = $\begin{pmatrix}1 & 2\\3 & 4\\5 & 6\end{pmatrix}$, B = $\begin{pmatrix}1 & 2 & 3\\4 & 5 & 6\\7 & 8 & 9\end{pmatrix}$ (i) A^2 (ii) B^2 (iii) AB (iv) BA

(A) (i) and (ii) only (B) (ii) and (iii) only (C) (ii) and (iv) only (D) all of these

93. $7^{4k} \equiv$ _____ (mod 100)

(A) 1 (B) 2 (C) 3 (D) 4

94. $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is

(A) linear (B) cubic (C) reciprocal (D) quadratic

95. If number of columns and rows are not equal in a matrix then it is said to be a

(A) diagonal matrix (B) rectangular matrix

(C) square matrix (D) identity matrix

96. Which of the following is not a measure of dispersion?

(A) Range (B) Standard deviation

(C) Arithmetic mean (D) Variance

97. If f: A → B is a bijective function and if n(B) = 7, then n(A) is equal to

(A) 7 (B) 49 (C) 1 (D) 14

98. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - cosec\,\theta)$ is equal to

(A) 0 (B) 1 (C) 2 (D) - 1

99. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all observations is

(A) 40000 (B) 160900 (C) 160000 (D) 30000

100. If f(x) = $2x^2$ and g(x) = $\frac{1}{3x}$, then $f\ o\ g$ is

(A) $\frac{3}{2x^2}$ (B) $\frac{2}{3x^2}$ (C) $\frac{2}{9x^2}$ (D) $\frac{1}{6x^2}$

101. If A = $\begin{pmatrix}1 & 2 & 3\\3 & 2 & 1\end{pmatrix}$, B = $\begin{pmatrix}1 & 0\\2 & -1\\0 & 2\end{pmatrix}$ and C = $\begin{pmatrix}0 & 1\\-2 & 5\end{pmatrix}$. Which of the following statements are correct?

(i) AB + C = $\begin{pmatrix}5 & 5\\5 & 5\end{pmatrix}$ (ii) BC = $\begin{pmatrix}0 & 1\\2 & -3\\-4 & 10\end{pmatrix}$

(iii) BA + C = $\begin{pmatrix}2 & 5\\3 & 0\end{pmatrix}$ (iv) (AB)C = $\begin{pmatrix}-8 & 20\\-8 & 13\end{pmatrix}$

(A) (i) and (ii) only (B) (ii) and (iii) only

(C)(iii) and (iv) only (D) all of these

102. $a\cot\theta + b\ cosec\ \theta = p\ and\ b\cot\theta + a\ cosec\ \theta = q$ then $p^2 - q^2$ is equal to

(A) $a^2 - b^2$ (B) $b^2 - a^2$ (C) $a^2 + b^2$ (D) b - a

103. For the given matrix A = $\begin{bmatrix}1 & 3 & 5 & 7\\2 & 4 & 6 & 8\\9 & 11 & 13 & 15\end{bmatrix}$ the order of the matrix A^T is

(A) 2 × 3 (B) 3 × 2 (C) 3 × 4 (D) 4 × 3

104. The range of the data 8, 8, 8, 8, 8. . . 8 is

(A) 0 (B) 1 (C) 8 (D) 3

105. The value of $sin^2\theta + \frac{1}{1 + tan^2\theta}$ is equal to

(A) $tan^2\theta$ (B) 1 (C) $cot^2\theta$ (D) 0

106. The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is

(A) 3 (B) 15 (C) 5 (D) 225

107. If $(\sin\alpha + cosec\ \alpha)^2 + (\cos\alpha + \sec\alpha)^2 = k + tan^2\alpha + cot^2\alpha$ then the value of k is equal to

(A) 9 (B) 7 (C) 5 (D) 3

108. Let f(x) = $\sqrt{1 + x^2}$ then

(A) f(xy) = f(x).f(y) (B) f(xy) $\geq f(x).f(y)$

(C) $f(xy) \leq f(x).f(y)$ (D) None of these

109. Let f and g be two functions given by f = {(0,1), (2,0),(3, - 4),(4,2),(5,7)}

g = {(0,2),(1,0),(2,4),(-4,2),(7,0)} then the range of $f\ o\ g$ is

(A) {0,2,3,4,5} (B) {-4,1,0,2,7} (C) {1,2,3,4,5} (D){0,1,2}

110. If the standard deviation of x, y, z is p then the standard deviation of 3x + 5, 3y + 5,3z + 5 is

(A) 3p + 5 (B) 3p (C) p + 5 (D) 9p + 15

111. If $\sin\theta = \cos\theta$, then $2tan^2\theta + sin^2\theta - 1$ is equal to

(A) $\frac{-3}{2}$ (B) $\frac{3}{2}$ (C) $\frac{-2}{3}$ (D) $\frac{2}{3}$

112. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}$, ... is

(A) $\frac{1}{24}$ (B) $\frac{1}{27}$ (C) $\frac{2}{3}$ (D) $\frac{1}{81}$

113. If $x = a\tan\theta$ and $y = b\sec\theta$ then

(A) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (B) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

(C) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (D) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

114. Let A = {1,2,3,4} and B = {4,8,9,10}. A function f: A → B given by f = {(1,4), (2,8), (3,9), (4,10)} is a

(A) Many-one function (B) Identity function

(C) One-to-one function (D) Into function

115. If A is a 2 × 3 matrix and B is a 3 × 4 matrix, how many columns does AB have

(A) 3 (B) 4 (C) 2 (D) 5

116. The value of $(1^3 + 2^3 + 3^3 + \cdots + 15^3) - (1 + 2 + 3 + \cdots + 15)$ is

(A) 14400 (B) 14200 (C) 14280 (D) 14250

117. The sum of all deviations of the data from its mean is

(A) Always positive (B) always negative

(C) zero (D) non-zero integer

118. If g = {(1,1), (2,3), (3,5), (4,7)} is a function given by $g(x) = \alpha x + \beta$ then the values of α and β are

(A) (- 1, 2) (B) (2, - 1) (C) (- 1, - 2) (D) (1, 2)

119. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

(A) 2 (B) 1 (C) 3 (D) 1.5

120. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}$: 1, then the angle of elevation of the sun has measure

(A) 45° (B) 30° (C) 90° (D) 60°

121. Variance of first 20 natural numbers is

(A) 32.25 (B) 44.25 (C) 33.25 (D) 30

122. If n (A × B) = 6 and A = {1, 3} then n (B) is

(A) 1 (B) 2 (C) 3 (D) 6

123. In the sequence t_1, t_2, t_3, ... are in A.P. then the sequence t_6, t_{12}, t_{18}, ... is

(A) a Geometric Progression (B) an Arithmetic progression

(C) neither an Arithmetic progression nor a Geometric progression

(D) a constant sequence

124. Transpose of a column matrix is

(A) unit matrix (B) diagonal matrix

(C) column matrix (D) row matrix

125. The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If PQ = 10 cm, then the length of AB is

(A) $6\frac{2}{3}$ cm (B) $10\frac{\sqrt{6}}{3}$ cm (C) $66\frac{2}{3}$ cm (D) 15 cm

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