MATHS

BOOKS - UNITED BOOK HOUSE

SUGGESSTION OR MADHYAMIK PARIKSHA

Exercise

1. The population of a village increase by r% each year. If P be the population after n years, then population n years ago was

A. $P\left(1 + \dfrac{r}{100}\right)^{-n}$

B. $P\left(1 - \dfrac{r}{100}\right)^{-n}$

C. $P\left(1 - \dfrac{r}{100}\right)^{n}$

D. $P\left(1 - \dfrac{r}{100}\right)^{2n}$

Answer:

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2. Arpita invested Rs 500 for 9 months and Aparna invested Rs 600 for 5 months in a business. The ratio of their profit share will be.

A. $3 : 2$

B. $5 : 6$

C. $6:5$

D. $9:5$

Answer:

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3. If the roots of the equation $ax^2 + bx + c = 0(a \neq 0)$

be equal then

A. $c = -\dfrac{b}{2a}$

B. $c = \dfrac{b}{2a}$

C. $c = -\dfrac{b^2}{4a}$

D. $c = \dfrac{b^2}{4a}$

Answer:

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4. The product of $\left(5 - \sqrt{3}\right)\left(\sqrt{3} - 1\right)\left(5 + \sqrt{3}\right)\left(\sqrt{3} + 1\right)$ is

A. 2

B. 22

C. 44

D. 11

Answer:

5. The length of each of two parallel chords AB and CD is 16cm. If the radius of the circle be 10cm, then the distance between the two chords is

A. 12 cm

B. 16 cm

C. 20 cm

D. 8 cm

Answer:

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6. AB is a diameter of a circle. C is any point on the circle,

$\angle ACB =$

    A. $30°$

    B. $45°$

    C. $60°$

    D. $90°$

Answer:

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7. If each of radius of the base and height of a cone be

doubled, then the volume of it will be____

A. 3 times

B. 4 times

C. 6 times

D. 8 times of the previous

Answer:

8. In a right circular cylinder, if the length of radius is halved and height is doubled, volume of cylinder will be

A. equal

B. double

C. half

D. 4 times

Answer:

9. If $A + B = 90°$ and $\tan A = \dfrac{3}{4}$ then the value of cotB is

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

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

C. $\dfrac{3}{5}$

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

Answer:

10. If $\tan\alpha + \cot\alpha = 2$, then the value of $\tan^{15}\alpha + \cot^{15}\alpha =$

A. 0

B. 1

C. 2

D. 15

Answer:

11. If the median of arranging the ascending order of data 8,9,12,17,x+2,x+4,30,31,34,39 is 24 then x=

A. 24

B. 20

C. 21

D. 22

Answer:

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12. Mode of 11,8,2,8,10,11,7,9,8,13,16 is

A. 8

B. 11

C. 7

D. 5.5

Answer:

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13. Fill in the blanks:

Without any other conditions in a partnership business, if the capitals of all the partners are invested for different time period, then such a business is called____.

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14. Fill in the blanks

The compound interest and simpe interest for one eyar at the fixed rate of interest on fixed sum of money are_____.

15. Fill in the blanks

If a:2 = b:5 = c:8 , then 50% of a = 20% of b=____% of c.

16. If the roots of the equation $ax^2 + bx + c = 0 (a \neq 0)$ are reciprocal to each other then

17. Fill in the blanks

The perpendicular bisector of any chord of a circle is passed through the _____of the circle.

18. Fill in the blanks

Two triangles are similar if their____sides are proportional.

19. Fill in the blanks

The shape of a pencil cutting one face is a combination of cone and_____.

20. Fill in the blanks

Number of surfaces of a solid hemisphere is_____.

21. Fill in the blanks

π radian is a_____angle.

22. Fill in the blanks

If $x \cos \theta = 3$ and $4 \tan \theta = y$, then $\dfrac{x^2}{9} - \dfrac{y^2}{16} =$____.

23. Fill in the blanks

Mean, median, mode are the measure of_____.

24. Fill in the blanks

At the time of finding A.M. the length of all clases are_____.

25. Write True or False

if the principal and the rate of simple interest in percent per annum be constants, then the total interest and the time are inverse relation.

26. Write True or False:

Ratio of capital of Riza and Sriza in a business is 5:4 and if Riza gets profit share of Rs 80 of total profit, Sriza will get profit share of Rs 100.

27. Write True or False

x^3y, x^2y^2 and xy^3 are in continued proportion.

28. Write True or False:

The roots of the equation $x^2 + x + 1 = 0$ are real.

29. Write True or False:

Only one circle can be drawn through three collinear points.

30. Write True or False

If the ratio of three sides of a triangle is 3:4:5, then the traingle is always a right angled triangle.

31. Write True or False

Height, radius and slant height of a right circular cone are the sides of the right angled triangle.

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32. Write True or False

If the ratio of curved surface of two hemisphere is 4:9 then the ratio of their radius is 2:3.

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33. Write True or False:

The value of $\cos 54°$ and $\sin 26°$ are equal.

34. Write True or False:

in $\triangle ABC$, $\angle B = 90°$, if AB = BC then $\tan\angle C = \dfrac{1}{\sqrt{3}}$.

35. Write True or False:

Mode of 10,3,19,10,3,19 is 10.

36. Write True or False:

Median of 3.5,7.5,9.5,2.5,6.5,5.5 is 6.

37. What is the rate of simple interest per annum, when the interest of some money in 4 years will be $\dfrac{8}{25}$ part of its principal?

38. If the rate of increase in population is r% per year, the population after n years is p, find the population that was n years before.

39. If $x = 5 + 2\sqrt{6}$ then find the value of $\sqrt{x} + \dfrac{1}{\sqrt{x}}$.

40. If one of the common root of the quadracti equations

$x^2 + bx + 12 = 0$ and $x^2 + bx + c = 0$ is 2, then find

the vaue of c.

41. If $x^2 + y^2 + z^2 = xy + yz + zx$ then find the value of (x+y):z.

42. If $\dfrac{1}{x} - \dfrac{1}{y}\alpha\dfrac{1}{y-x}$, show that $x\alpha y$.

43. Ratio of the area of two similar triangle is 16:25. find the ratio of their sides.

44. Radii of two circles are 2 cm and 3 cm and the distance between the centres of them is 13cm . Find the length of their oblique common tangent.

45. AOB is a diameter of a circle having centre.O. C is any point on it. If $\angle OBC = 60°$, then $\angle OCA$=?

46. In triangle ABC, AB = (2a-1)cm, $AC = 2\sqrt{2a}$cm, BC = (2a+1)cm, find $\angle BAC$.

47. If the volume and lateral surface of a right circular cone are numarically equal and the height and base radius of the cone are h and r respectively, then the value of $\dfrac{1}{r^2} + \dfrac{1}{h^2}$ is

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48. If the length of radius of a sphere is increased by 50%, then how much percent will be increased of its curved surface area.

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49. If the height of two right circular cylinder are in the ratio of 1:2 and perimeter of the bases are in ratio of 3:4, find the ratio of their volumes.

50. The length of two adjacent walls of a room are 12m and 8 m respectively. If the height of the room is 4m then find the area of the floor of the room.

51. Find the minimum value of $\left(9\tan^2\theta + 4\cot^2\theta\right)$ when $0° \le \theta \le 90°$.

52. Find the value of $\dfrac{2\sin^2 63° + 1 + 2\sin^2 27°}{3\cos^2 17° - 2 + 3\cos^2 73°}$

53. If $\tan\alpha . \tan 2\alpha = 1$ then find the value of $\cos 2\alpha$.

54. If $0° \le \theta \le 90°$ then show that $\sin\theta + \cos\theta > 1$.

55. If the mean of 7,(x-3),10,(x+3) and (x-5) is 15, then find the median of the given data.

56. If $u_i = \dfrac{x_i - 25}{10}$, $\sum f_i u_i = 20$ and $\sum f_i = 100$ then find the value of $\bar{x}$.

57. At the same rate of simple interest in percent per annum, if a principal becomes are amount of Rs 7100 in 7 yrs and of Rs 6200 in 4 yrs, then find the principal and rate of simple interest in percent per annum.

58. If simple interest and compound interest of a certain sum of money for two years are Rs 8400 and Rs 8652 respectively, then calculate the sum of money and rate of interest.

59. Nivedita and Uma have started a business with capital Rs.3000 and Rs 5000 respectively. After 6 months Nivediata invested Rs. 4000 more but after 6 months Uma withdreq Rs. 1000. If the profit at the end of the year is Rs. 6175,, calculate the profit share of each of them.

60. As a result of publicity on against smoking the number of smoker is decreased by $6\dfrac{1}{4}\%$ every year in comparison to its previous year. If the number of smokers at present in a citgy is 33,750 then find the number of smokers in that city 3 years before.

61. Solve: $\dfrac{x}{x+1} + \dfrac{x+1}{x} = 2\dfrac{1}{12}\,(x \neq 0,\ -1)$

62. Solve:

$$\frac{12x + 17}{3x + 1} - \frac{2x + 15}{x + 7} = 3\frac{1}{5} \left[x \neq -\frac{1}{3}, -7 \right]$$

63. The ratio of the roots of the quadratic equation $ax^2 + bx + c = 0 (a \neq 0)$ is 1:r, then show that $\frac{(r + 1)^2}{r} = \frac{b^2}{ac}$.

64. A man travelled 84 kms by cycle and observed that if he would be cycling with the speed of 5 km/ hr more,

then the time taken to complete the journey is reduced

by 5 hrs. Calculate the speed of the cycle.

65. If $(a+b)\alpha\sqrt{ab}$, then show that $(\sqrt{a}+\sqrt{b})\alpha(\sqrt{a}-\sqrt{b})$.

66. If $x\alpha y + x$ (k is constant), $y\alpha(z+x)$ (l is constant), $z\alpha(x+y)$ (m is costant), then show that

$$\frac{k}{k+1} + \frac{l}{l+1} + \frac{m}{m+1} = 1.$$

67. Solve: $\sqrt{4x - 9} + \sqrt{4x + 9} = 5 + \sqrt{7}$.

68. If $x = \dfrac{\sqrt{7} + \sqrt{3}}{\sqrt{7} - \sqrt{3}}$ and xy = 1, find the value of

$$\dfrac{x^2 + 3xy + y^2}{x^2 - 3xy + y^2}$$

69. If $\dfrac{a^3 + 3ab^2}{3a^2b + b^3} = \dfrac{63}{62}$ the find (5a-3b):(3a-b).

70. If a,b,c,d are in continued proportion then show that

$$bc\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}\right) = a + b + c + d.$$

71. If $\dfrac{a + b}{b + c} = \dfrac{c + d}{d + a}$ then prove that either c= a or

a+b+c+d = 0.

72. If ay - bx/c = cx - az/b = bz - cy/a, then prove that x/a =

y/b = z/c.

73. Prove that the front angle formed at the centre of a circle by an arc is the double of the angle formed by the same arc at any point on the circle.

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74. Prove that opposite angles of a cyclic quadrilateral are supplementary

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75. State and prove Pythagoras theorem.

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76. If two circles touch each other externally then the point of contact will on the line- segment joining the two centers___prove it.

77. State and prove the convere of the Pythagoras theorem.

78. Prove that two equal chords are equidistant from the centre of the circle.

79. If two chords AB and CD of a circle with centre O, when produce intersect each other at the point P, then prove $\angle AOC - \angle BOD = 2\angle BPC$.

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80. ABCD is a cyclic quadrilateral. The bisectors of $\angle DAB$ and $\angle BCD$ intersect the circle at the points X and Y respectively. Prove that XY is a diameter of the circle.

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81. In a isosceles triangle ABC , $\angle B$ is right angle. Bisector of $\angle BAC$ intersect BC at D. Prove that $CD^2 = 2BD^2$.

82. Draw a triangle ABC, whose AB = 4.5 cm , BC = 3.5cm and $\angle ABC = 90°$. Now draw the circumcircle of $\triangle ABC$.

83. Draw an equilateral triangle having each side of length 6.5 cm. Now draw the circumcircle of this triangle.

84. Draw a triangle ABC whose BC = 9 cm, AB = 7 cm and AC = 8cm. Now draw the incircle of the $\triangle ABC$. (Only traces of construction are required).

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85. Draw a triangle having sides 6cm, 8 cm and 10 cm. Now draw the incircle of this triangle.

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86. If $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$, then show that

$\cos\theta + \sin\theta = \sqrt{2}\cos\theta$.

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87. If the difference between two acute angles of a right

angled triangle is $\dfrac{2\pi}{5}$, then find the circular and

sexagecimal values of two acute angles.

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88.   Solve:

$(x+1)\cot^2\left(\dfrac{\pi}{6}\right) = 2\cos^2\left(\dfrac{\pi}{3}\right) + \dfrac{3}{4}\sec^2\left(\dfrac{\pi}{4}\right) + 4\sin^2\left(\dfrac{\pi}{6}\right)$

.

89. Find the value of

$$\sin^2 60° \cot 30° - 2\sec^2 45° + 3\cot 60° \tan 45° - \tan^2 60°$$

.

90. Show that $\tan 15° + \tan 75° = \dfrac{\sec^2 15°}{\sqrt{\sec^2 15° - 1}}$

91. If $5\sin^2 \theta + 4\cos^2 \theta = \dfrac{9}{2}$, find the value of $\tan \theta$.

92. A man standing on a railway bridge $5\sqrt{3}$ meters high, observes the engine of a train at an angle of depression $30°$. But after 2 seconds, he observes the engine at an angle of depression $45°$ on the other side of the bridge. Find the speed of the train.

93. From a point on the roof a house 11 metres height, it is observed that the angles of depression of the tip and foot of a lamp post are $30°$ and $60°$ respectively. Find the height of the lamp post.

94. The length of a flag at the roof of three storied building is 3.3 metres. From any point of road, the angles of elevation of the top and the foot of the falgspot are $50°$ and $45°$. Find the height of the three-storied building . $[\tan 50° = 1.192]$

95. Half of the cuboidal water tank with length 2.1m and breadth of 1.5m is filled with water. If 630 lit water is poured more into the tank, then calculate and write the depth that will be increased by.

96. An outlet pipe in the roof with length 13m and breadth 11m was closed at the time of rain fall. After rain fall, it was seen that water habing logged in the roof with 7cm depth. The length of diameter of outlet pipt is 7cm and water comes our cylindrically with 200m length/min. Calculate the time required is drainout whole amount of water after opening the pipe.

97. If two solid spheres with the radii of 1 cm and 6 cm lengths are melted and a hollow sphere with the

thickness of 1 cm is made, calculate the outer curved surface area of the hollow sphere.

98. The slant height of a right circular cone is 7 cm and the total surface area of its is 147.84 sq.cm. Find the base radius of the cone.

99. If the mean of the following data is 54 then find the value k.

Class	0-20	20-40	40-60	60-80	80-100
frequency	7	11	k	9	13

100. Find the median of the following distribution table.

Class limit	1-5	6-10	11-15	16-20	21-25	26-30	31-35
frequency	2	3	6	7	5	4	3

101. Find themode of the following frequency

distribution.

Class limit	0-5	5-10	10-15	15-20	20-25	25-30	30-35
frequency	5	12	18	28	17	12	8

102. Find the mean of the following frequency distribution table.

Class limit	10-20	20-30	30-40	40-50	50-60	60-70
frequency	10	16	20	30	13	11

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103. Draw an ogive from the following data(less then type):

Class limit	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	1	6	1·5	20	15	6	1

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104. Find the mode of the following distribution table.

Class	50-54	55-59	60-64	65-69	70-74	75-79	80-84
frequency	~ 2	8	12	24	34	16	4

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