MATHS

BOOKS - UNITED BOOK HOUSE

HOWRAH ZILLA SCHOOL

Exercise

1. Price of a machine is Rs 2,00,000. The price of it decrease in 1st year and 2nd year by 15% and

10% respectively. The price of the machine will be after 2 years is

A. Rs 1,47,000

B. 150000

C. 157000

D. 153000

Answer:

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2. If one root of the equation $(\alpha - 4)x^2 + 2x + 1 = 0$ is 1, then α=

A. 1

B. 2

C. 3

D. 4

Answer:

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3. If $\sin 2\theta = \cos 3\theta$ then θ=

A. $\frac{\pi^c}{10}$

B. $\frac{\pi^c}{2}$

C. $\frac{\pi^c}{5}$

D. $\frac{\pi^c}{3}$

Answer:

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4. If the height and area of base of a right circular cone increased by 100% then its volume will be

A. 3 times

B. 4 times

C. 5 times

D. 12 times

Answer:

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5. Median of 94,33,86,32,80,48,70 is

A. 68

B. 69

C. 70

D. 71

Answer:

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6. Ratio of the area of two similar triangles is 9:25. The ratio of their base is

A. $3:5$

B. $5:3$

C. $9:25$

D. $25:9$

Answer:

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7. Fill in the blanks

If the ratio of principal and amount in 1 year is 10:11, then the rate of interest per annum is____.

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8. Fill in the blanks

If $5+\sqrt{x}=y+\sqrt{2}$ (where $\sqrt{x}$ is a irrational number) then x+y =_____.

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9. Prove that

$\tan 1^\circ \tan 2^\circ \tan 3^\circ \ldots\ldots . \tan 88^\circ \tan 89^\circ = 1$

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10. Fill in the blanks

If two circles of radii 5 cma and 3 cm in length are touch internally then the distanace between their centre is_____.

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11. Fill in the blanks

If the ratio of the volume of two sphere is 1:8, then the ratio of their curved surface area will be_____.

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12. Fill in the blanks

Value of $\sum_{I=1}^{3} 10i^3$ is_____.

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13. Write True or False

If the amount (principal+compound interest) of Rs 100 for 2 years is Rs 121, then the rate of compound interest per annum is 10%.

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14. Write True or False

If $x \alpha y$ then $x^n \alpha y^n$.

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15. Write True or False

Mean number of the numbers 5,6,7,8,9,10,11,12,13,14,15 is 10.

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16. Write True or False

If $\tan 35^\circ \tan 55^\circ = \sin A$ then $A = 45^\circ$.

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17. Write True or False

If the radius of a right circular cylinder is doubled then the volume of it will be double of the 1st cylinder.

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18. Write True or False

Only one circle can be drawn which touches the all sides or extended sides of a triangle.

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19. Find the difference betweeen compound interest and simple interest of Rs 10,000 for 2 years at the rate of interest 10% per annum.

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20. Find the nature of the roots of the equation $2x^2 - \sqrt{3}x + 2 = 0.$

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21. If a αb and $b\alpha c$, show that $a^3 + b^3 + c^3 \alpha 5abc$.

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22. OA and OB are the radius of a circle with centre at O and $\angle AOB = 150^\circ$. The tangents at A and B intersects at C. Find $\angle ACB$.

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23. The diagonals of a square ABCD intersect at O. If the length of each sides of the square is 6cm then find the value of $OA^2 + OB^2 + OC^2 + OD^2$.

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24. ABCD is cyclic quadrilateral. Extended BA upto F. AE||CD and if $\angle ABC = 92^\circ, \angle FAE = 20^\circ,$ then find $\angle BCD$.

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25. Find the value of $\frac{1}{1+\sin^2 20^\circ}+\frac{1}{1+\cos ec^2 20^\circ}$.

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26. Find the value of $\sin^6\alpha+\cos^6\alpha+2\sin^2\alpha\cos^2\alpha$.

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27. The volume of a cuboid is 432 c.c. By melting it, to make two cube of equal volume. Find the each side of the cube,

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28. The lower and upper part of a solid object are hemispherical and conical respectively. If the area of total surface of 2 parts are equal, then find the ratio of the height of two parts of this object.

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29. If $u_i = \frac{x_i - 25}{10}$ $\sum f_i u_i = 20$ and $\sum f_i = 100$, find $\bar{x}$.

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30. In a partnership business, the ratio of the capitals of three partners is 3:8:5, and the profit of 1st partner is Rs 60 less of the 3rd person, then calculate the total profit of that business.

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31. A man deposits the money for each of his three sons in such a way that when the ages of each of his sons will be 18 years each one will get RS 25,300. The rate of simple interest per annum in the bank is 5% and the present ages of his sons are 10 years, 12 years, and 14 years respectively. Determine the money, he had deposited separately in the bank for the each of his sons.

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32. A and B started a business in partnership by investing in the ratio of 7 : 9. After 3 months A withdraw 23 of its investment and after 4 months from the beginning B withdraw 33 1/3 of its investment. If a total earned profit is Rs. 10201 at the end of 9 months, find the share of each in profit.

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33. Solve: $\frac{a+x-2b}{2a-b}-\frac{a-2b}{x}=1.$

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34. If one root of the equation $ax^2 + bx + c = 0$ is square the other root, then prove that $b^3 + ac^2 + a^2c = 3abc$.

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35. If $x + y\alpha z$, when y is constant, $(x + z)\alpha y$ when z is constant, then show that $(x + y + z)\alpha yz$ when y and z both are constant.

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36. If $x = \frac{\sqrt{a+2b} + \sqrt{a-2b}}{\sqrt{a+2b} - \sqrt{a-2b}}$, then show that $bx^2 - ax + b = 0$

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37. If a,b,c,d are in continued proportion then show that $abcd\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}\right)^2 = (a+b+c+d)^2$

.

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38. If x = cy+bz, y =az+cx, z = bx+ay then prove that $\frac{x^2}{1-a^2} = \frac{y^2}{1-b^2} = \frac{z^2}{1-c^2}$.

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39. State and Prove Pythagoras theorem.

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40. Prove that the tangent and the radius through the point of contact of a circle are perpendicular to each other.

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41. Two tangents are draw from an external point A to the cirle with centre at O. If they touch the circel at the point B and C then prove that AO is the perpendicular bisector of BC.

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42. ABC is a right angled triangle whose $\angle A = 90^\circ$, AD is perpendicular on BC. Prove that $\frac{areaof\ \triangle ABC}{areaof\ \triangle ACD} = \frac{BC^2}{AC^2}$.

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43. Draw a circle with radius 2.8 cm in length. Take point apart from the centre 7.5 cm in length. Draw two tangent to the circle from this external point.

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44. Geometrically find the value of $\sqrt{38}$ (only traces of construction are required).

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45. If $\sec\theta + \tan\theta = 2 + \sqrt{5}$, show that $\sin\theta + \cos\theta = \frac{3}{\sqrt{5}}$ where θ is positive acute angle.

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46. If α and β are complementary angles to each other, the find the value of $(1-\sin^2\alpha)(1-\cos^2\alpha)(1+\cot^2\beta)(1+\tan^2\beta)$

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47. If $\sec\theta = \frac{2xy}{x^2+y^2}$ possible? When x and y are positive real numbers.

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48. From the bottom of a 'tila' the angle of elevation of its unreachable top is 45°. After moving 100 metre at an angle of 30° along the tila the angle of elevation becomes 60°. Find the height of the tila.$\left(\sqrt{3} = 1.732\right)$

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49. A spherical ballon of radius r while floating in the sky, makes an angle α in the eye of viewer. If the angle of elevation of the centre of the ballon in the eye of the viewer be β, show

that the altitude of the centre of the ballon from the ground is $r \cos ec \frac{\alpha}{2} \sin \beta$.

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50. Two parallel planes which are parallel to the base of a right circular, cone cut the height of the cone are equally. Show that the ratio of the volume of three parts of the cone is 1:17:19.

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51. A cylindrical vessel of radius 4 cm contains water. A solid sphere of radius 3 cm is lowered into the water, until it is completely immersed. Find the rise in the water level (in cm) in the vessel.

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52. The height and diameter of each of three right circular cylinders are 20cm and 12 cm respectively. If the cylinders touch each other

then find the volume of the protion which is bounded by the thee cylinders.

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53. Calculate the mean of the following frequency distribution table.

Class limit	45-54	55-64	65-74	75-84	85-94	95-104
frequency	8	13	19	32	12	6

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54. If the median of the following frequency distribution is 27, then find the value of a.

Class limit	0-10	10-20	20-30	30-40	40-50
frequency	3	a	20	12	7

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55. Find the mode of the following frequency distribution of obtained marks of 22 students.

Class limit (marks obtained)	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50
No. of students	3	8	17	20	22

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