



MATHS

BOOKS - UNITED BOOK HOUSE

QUESTION PAPER 2020

Exercise

1. If a principal becomes twice of it in 10 years then the rate of simple interest is _____

A. 5%

B. 10%

C. 15%

D. 20%

Answer:



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2. The product of two roots of the equation

$$x^2 - 7x + 3 = 0 \text{ is } \underline{\hspace{2cm}}$$

A. 7

B. -7

C. 3

D. -3

Answer:



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3. The length of two chords AB and CD of a circle of centre O are equal and $\angle AOB = 60^\circ$, then $\angle COD$ is _____

A. 30°

B. 60°

C. 120°

D. 180°

Answer:



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4. If the ratio of the volume of two right circular cones is 1 : 4 and the ratio of radii of

their bases is $4 : 5$ then the ratio of their heights is ____

A. $1 : 5$

B. $5 : 4$

C. $25 : 16$

D. $25 : 64$

Answer:



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5. If $\sin \theta - \cos \theta = 0$, ($0^\circ < \theta < 90^\circ$) and $\sec \theta + \csc \theta = x$, then the value of x is

A. 1

B. 2

C. $\sqrt{2}$

D. $2\sqrt{2}$

Answer:



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6. The mode of 1, 3, 2, 8, 10, 8, 3, 2, 8, 8 is ____

A. 2

B. 3

C. 8

D. 10

Answer:



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7. Fill up the blanks: Anisur invests ₹ 500 for 9 months in a business and Devid invests ₹ 600 for 5 months in the same business the ratio of their profit will be _____



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8. The roots of the same quadratic equation $ax^2 + 2bx + c = 0$ ($a \neq 0$) are real and equal then $b^2 =$ _____



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9. If sum of two angles is _____ then they are called supplementary angles.



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10. Maximum value of $\sin 3\theta$ is _____.



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11. One solid sphere is melted and a solid right circular cylinder is made then _____ of sphere and the cylinder will be equal.



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12. Ages of some students are (in years) 10, 11, 9, 7, 13, 8, 14 the median of the ages of those students is _____ years.



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13. Write True or False : The amount of ₹ $2p$ in t years at the rate of simple interests of $r/2\%$ per annum is ₹ $(2p + prt/100)$.



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14. If $2a = 3b = 4c$ then prove that $a : b : c = 6:4:3$.



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15. True or false: If the ratio of the lengths of three sides of a triangle is $5 : 12 : 13$, then the triangle will always be a right angled triangle.



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16. True or false: The angle formed by rotating a ray about its end point in anticlockwise direction is positive.



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17. If n is even number, then median is the mean of $(n/2)$ th and $(n/2 - 1)$ th observation.



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18. If the length of the radius of the base of a right circular cone be halved and its height be doubled, then the volume remains same.



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19. Answer any ten questions : If the ratio of a principal and the amounts for 5 years is 5 : 6, then find the rate of simple interest per annum.



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20. In a business A and B get ₹ 1,050 as profit. If the principal and profit of A be ₹ 900 and ₹ 630 respectively. Find the principal of B.



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21. If $x \propto y$, $y \propto z$ and $z \propto x$, find the product of three variation constant.



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22. If the roots of the quadratic equation $5x^2 - 2x - 3 = 0$ be α and β , find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.



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23. The point O is situated within the rectangular region $ABCD$ in such a way that $OB = 6$ cm, $OD = 8$ cm and $OA = 5$ cm. Determine the length of OC .



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24. In a right angled triangle ABC , $\angle ABC = 90^\circ$, $AB = 3$ cm, $BC = 4$ cm and the perpendicular BD on the side AC from the point B which meets the side AC at the point D . Determine the length of BD .



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25. The lengths of radii of two circles are 8 cm and 3 cm and the distance between two centres is 13 cm. What is the length of the direct common tangent of two circle?



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26. What is the circular measure of an angle formed by the rotation of hour hand of a clock in one hour duration?



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27. If $\tan 40^\circ \times \tan 6\theta = 1$ and 6θ is a positive acute angle. find the value of θ ?



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28. The height of a right circular cone is 12 cm and its volume is $100\pi \text{ cm}^3$. Find the lateral height of the cone.



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29. Curved surface areas of two spheres are in a ratio 1 : 4. Find the ratio of their volumes.



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30. If $u_i = \frac{x_i - 35}{10}$, $\sum f_i u_i = 30$ and $\sum f_i = 60$, then determine the value of \bar{x} .



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31. Question: The price of a machine in a factory of your uncle depreciates at the rate of 10% every year. If its present price is ₹ 6,000 then what will be its price after 3 years?



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32. Three friends invested ₹ 1,20,000, ₹ 1,50,000 and ₹ 1,10,000 respectively to purchase a bus. The first person is a driver and the other two are conductors. They decided to

divide $\frac{2}{5}$ th of the profit among themselves in the ratio of 3 : 2 : 2 according to their work and the remaining in the ratio of their capitals. If they earn ₹29,260 in one month, find share of each of them.



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33. Answer any one question : Solve $\frac{1}{x} - 3 - \frac{1}{x} + 5 = \frac{1}{6}$.



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34. The product of two consecutive positive odd numbers is 143 Construct the equation and determine the numbers by applying Sridhara Acharyya's formula.



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35. Answer any one question : $x = 2 + \sqrt{3}$ and $x + y = 4$, then find the simplest value of $xy + 1/xy$.



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36. If $a \propto b$ and $b \propto c$, then prove that

$$a^3 + b^3 + c^3 \propto 3abc.$$



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37. Answer any one question : If $x : a = y : b = z :$

c, then show that
$$\frac{x^3}{a^3} + \frac{y^3}{b^3} + \frac{z^3}{c^3} = \frac{3xyz}{abc}.$$



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38. If $ay - bx/c = cx - az/b = bz - cy/a$, then prove that $x/a = y/b = z/c$.



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39. Answer any one question : Prove that angles in the same segment of a circle are equal.



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40. Prove that if two tangents are drawn to a circle from a point outside it, then the line segments joining the point of contacts and the exterior point are equal.



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41. Answer any one question : Two circle intersect each other at the points P and Q. If the diameters of the two circle are PA and PB

respectively, then prove that A, Q, B are collinear.



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42. ABC is a right angled triangle whose $\angle A = 90^\circ$, AD is perpendicular on BC. Prove

that
$$\frac{\text{area of } \triangle ABC}{\text{area of } \triangle ACD} = \frac{BC^2}{AC^2}.$$



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43. Draw the mean proportional of line segments of lengths 4 cm and 3 cm.



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44. Draw a circle of radius 3 cm. Construct a tangent to the circle at a point A on the circle.



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45. Answer any two questions : If $\sin 17^\circ = \frac{x}{y}$, show that $\sec 17^\circ - \sin 73^\circ = \frac{x^2}{y\sqrt{y^2 - x^2}}$.



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46. If the sum of two angles is 135° and their difference is $\frac{\pi}{2}$, then the of two angles.



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47. The length of outer and inner radii of a hollow right circular pipe are 5 cm and 4 cm respectively. If the total surface area of the pipe is 1188 sq. cm, find the length of the pipe.



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48. A hemispherical bowl with radius of 9 cm is completely filled with water. How many cylindrical bottle of diameter 3 cm and height

4 cm can be filled up with the water in the bowl.



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49. The diameter of the base of a right circular cone is 21 metres and height is 14 metres. What will be the expenditure to colour the curved surface at the rate ₹ 1.50 per square metre?



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50. Find the median of given data :

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



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51. Find the mode of data from the following frequency distribution table :

ClassInterval	F requency
10 – 25	2
25 – 40	3
40 – 55	7
55 – 70	6
70 – 85	6
85 – 100	6



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