



MATHS

BOOKS - UNITED BOOK HOUSE

HOOGLY COLLIGIATE SCHOOL

Exercise

1. Interest of Rs x for y months at the rate of 20% simple interest is

A. $Rs \frac{xy}{100}$

B. $Rs \frac{xy}{120}$

C. $Rs \frac{xy}{60}$

D. $Rs \frac{xy}{600}$

Answer:



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2. If $x = \sqrt{2 - \sqrt{3}}$ and $x + \frac{1}{x} = k$, what is k^2 ?

A. 6

B. 4

C. $\sqrt{3}$

D. $2\sqrt{3}$

Answer:



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3. ABCD is a cyclic trapezium having $AD \parallel BC$. If

$\angle ABC = 70^\circ$ then $\angle BCD = ?$

A. 110°

B. 80°

C. 70°

D. 120°

Answer:



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4. If $\cos^2 \theta - \sin^2 \theta = \frac{1}{2}$. Then $\tan \theta =$

A. $-\frac{1}{\sqrt{3}}$

B. $\frac{1}{3}$

C. $\frac{1}{\sqrt{3}}$

D. $-\frac{1}{3}$

Answer:



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5. If two cubes of length of each side $2\sqrt{6}$ cm are placed side by side, then the length of the diagonal of the cuboid so produced is ___

A. 10 cm

B. 6 cm

C. 2 cm

D. 12 cm

Answer:



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6. If the median of arranging the ascending order of data 8,9,12,17, $x+2$, $x+6$,30,31,34,39 is 24, then the value of x is

A. 22

B. 21

C. 20

D. 24

Answer:



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7. Fill in the blanks

The interest of Rs _____ for x years at the rate of $x\%$ simple interest per annum is Rs x .



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8. Fill in the blanks

If $a:2 = b:5 = c:8$, then 50% of $a = 20\%$ of $b = \underline{\quad}$ % of c .



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9. The perimeter of two similar triangles are 20 cm and 16 cm respectively. If the length of one side of the first triangle is 9 cm, then find the

length of the length corresponding side of second triangle.



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10. Fill in the blanks

If $\cos(67^\circ 30') \times \operatorname{cosec}(22^\circ 30') = \tan \theta$, then the minimum positive value of θ is_____.



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11. Fill in the blanks

The radius of a sphere and that of a right circular cylinder are r , if their volumes are equal then the height of the cylinder is_____.



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12. The measures of central tendency are Mean, Median and _____



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13. The simple interest on a sum of money for 2 years at 4% per annum is Rs. 340. Find the sum of money?



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14. True or false: The compound ratio of $ab : c^2$, $bc : a^2$ and $ca : b^2$ is 1 : 1.



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15. Write True or False

The angle in the segment of a circle which is greater than a semicircle is an acute angle.



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16. Write True or False

Maximum value of $\sin \theta + \cos \theta$ is $\sqrt{2}$.



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17. Write True or False

If the length of radius of a right circular cylinder doubled then the volume of it will be douybled the prevous cylinder.



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18. Write True or False

Mode of the data 2,3,9,10,9,3,9 is 10.



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19. What is the rate of simple interest per annum, when the interest of some money in 10 yrs will be $\frac{2}{5}$ th part of it amount?



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20. In a joint business Kalu invests ₹ 60,000 for 9 months and Viki invests ₹ 80,000 for some months. They get ₹ 18,000 and ₹16,000 respectively as profit. In this business, the investment of Viki was for



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21. If $x + \frac{1}{x} = \sqrt{3}$, find the value of $x^{30} + x^{24} + x^{18} + x^{12} + x^6 + 1$.



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22. If the sum of the square of the roots of the equation $6x^2 + x + k = 0$ is $\frac{25}{36}$, then find the value of k.



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



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24. The radius of a circle with centre O is 5cm. P is a point at a distance 13cm from O. PQ and PR are two tangents to this circle. Find the area of the quadrilateral PQOR.



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25. In a right angled triangle $\angle ABC = 90$ and $BD \perp AC$. If $BD = 88$ cm and $AD = 4$ cm then find the length of CD .



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26. In $\sin \theta + \cos \theta = \sqrt{2}$, find the value of θ .



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27. Height of a flying kite from the ground is 300 metre and if the angle of elevation of that kite is 30° , then find the distance of kite from the boy to fly the kite.



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28. Total surface area of a solid hemisphere and the curved surface area of a solid sphere are same. Find the ratio of the lengths of the radius of hemisphere and shpere.





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29. Find the volume of the largest solid cone that can be cutout frm a solid hemisphere of r unit radius.



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30. 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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31. Aminur has taken a loan of ₹. 64,000 from a bank. If the rate of interest be 2.5 paise per rupee per annum, calculate the compound interest payable after 2 years.



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32. A,B,C have started a partnership business by investing Rs 6,000 Rs 8,000 and Rs 9,000. After few months A has invested Rs 3000 more. At the end of the year, if the total profit

is Rs 3,000 and the profit share of C is Rs 10,800, then find the period for which A's capital of Rs 3,000 has been invested.



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33. Joseph and Kuntal work in a factory. Joseph takes 5 minutes less time than Kuntal to make a product. Joseph makes 6 products more than Kuntal while working for 6 hours. Find the number of products Kuntal makes during that time.



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34. Prove that the quadratic equation

$$(a^2 + b^2)x^2 + 2(ac + bd)x + (c^2 + d^2) = 0$$

has no real roots when $ad \neq bc$.



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35. If $x = \frac{4\sqrt{15}}{\sqrt{5} + \sqrt{3}}$, then

$$\frac{x + \sqrt{20}}{x - \sqrt{20}} + \frac{x + \sqrt{12}}{x - \sqrt{12}} = ?$$



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36. If $x \propto y$ and $y \propto z$, then prove that :

$$(x^2 + y^2 + z^2) \propto (xy + yz + zx).$$



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37. If $\frac{x^2 - yz}{a} = \frac{y^2 - zx}{b} = \frac{z^2 - xy}{c}$, show

that $(a+b+c)(x+y+z) = (ax+by+cz)$.



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38. If $\frac{b+c-a}{x+y-x} = \frac{c+a-b}{c+x-y} = \frac{a+b-c}{x+y-z}$,

then prove that $\frac{a}{x} = \frac{b}{y} = \frac{c}{z}$.



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39. State and Prove Pythagoras theorem.



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40. Answer any One question : Prove that, if a perpendicular is draw on the hypotenuse from

the right angled triangle, two triangles so formed on the two sides of the perpendicular are each similar to the original triangle and also similar to each other.



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41. If in $\triangle ABC$, $\angle A$ is right angle and BP and CQ are two medians, then prove that $5 BC^2 = 4 (BP^2 + CQ^2)$.



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42. ABC is a triangle whose $AB = AC$. E is any point on extended BC , circumcircle of $\triangle ABC$ intersects AE at D . Prove that $\angle ACD = \angle AEC$.



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43. Geometrically find the value of $\sqrt{29}$.



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44. Draw a right angled triangle length of hypotenuse and one of another side are 9 cm and 5.5 cm respectively. Now draw the incircle of this triangle.



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45. In a circle, if an arc of 220 cm length subtends and angle of measure 60° at the centre, then determine the radius of the circle



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46. If $\sin \theta + \cos \theta = \frac{7}{5}$ then $\sin \theta \cos \theta = \frac{12}{25}$, find the value of $\sin \theta$ and $\cos \theta$.



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47. Find the value of $\frac{\sin 25^\circ}{\sec 65^\circ} + \frac{\cos 25^\circ}{\csc 65^\circ}$.



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48. 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.



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49. If the angle of depression of two consecutive km stones on a road from an aeroplane are 60° and 30° respectively, then

find the height of the aeroplane when the two km stones on the same side of the aeroplane.



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50. The length and breadth of a rectangular field of the village are 20m and 15 m respectively. For construction of pillars in the 4 corners of that field 4 cubic holes having length of 4 m are dug out and the soils removed are dispersed on the remaining land.

Calculate 6 and write the height of the surface of field that is increased by.



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51. The external radius of a hollow sphere made of lead sheet of 1 cm thickness in 6cm.. If melting the sphere, a solid circular rod of 2cm radius is made, then find the length of the rod.



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52. The length of two sides adjacent to right angle of a right angled triangle are 3 cm and 4 cm. Find the volume of the solid formed by complete revolving the triangle once by taking the hypotenuse as axis.



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53. Calculate the mean of the following data by step deviation method.

Class limit	0-30	30-60	60-90	90-120	120-150
frequency	12	15	20	25	8



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54. Find the mode 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



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55. Make a cumulative frequency distribution (greater than type) table and draw an ogive.

Class limit	0-5	5-10	10-15	15-20	20-25	25-30
frequency	4	10	15	8	3	5



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