MATHS

BOOKS - AGRAWAL PUBLICATION

2020 QUESTION PAPER (1)

Exercise

1. Two right circular cones have their heights in the ratio 1 : 3 and radii in the ratio 3 : 1, what is the ratio of their volumes?

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2. Using the empirical formula, find the mode of a distribution whose mean is 8.32 and the median is 8.05.

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3. The probability that it will rain tomorrow is 0.85. What is the probability that it will not rain tomorrow?

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4. What is the arithmetic mean of the first 'n' natural numbers?

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5. Find the 11^{th} term from the last term of the AP 12, 8, 4,.....-84.

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6. Solve the equation: 1 + 5 + 9 + 13 +.....+x = 1326.

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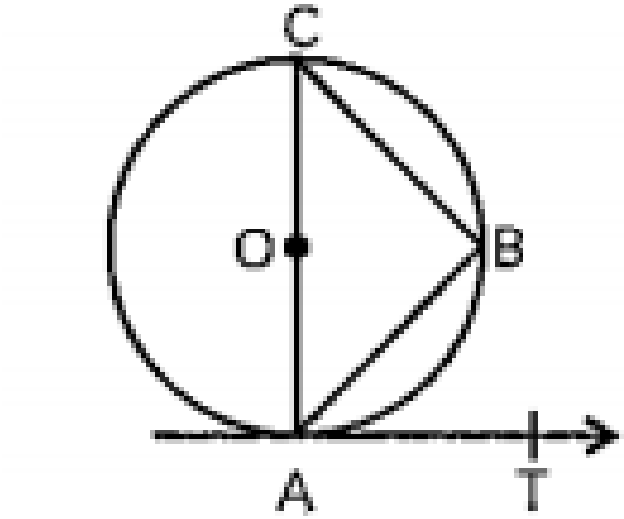
7. In the figure, AB is a chord with centre O, AOC is the diameter and AT is a tangent touching the circle at A. Prove that $\angle BAT$ =

$\angle ACB$.



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8. If $\tan\theta = \frac{3}{4}$, find the value of $\frac{1-\cos^2\theta}{1+\cos^2\theta}$

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9. If $\tan\theta = \sqrt{3}$, find the value of $\dfrac{2\sec\theta}{1+\tan^2\theta}$

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10. Students of Class XII presencted a gift to their school in the from of an electric lamp in the shape of a glass hemispherical base surmounted by a metallic cylindrical top of same radius 21 cm and height 3.5 cm. The top was silver coated and the glass surface was painted red

What is the cost of silver coating the top at the rate of $Rs.5 per 100 cm^2$?

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What is the surface area of glass to be painted red?

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12. Find the probability that a leap year selected at random will contain 53 Sundays and 53 Mondays.

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13. Find the value of p, if the mean of the following distribution is 7.5

Classes	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12	12 – 14
Frequency (f_i)	6	8	15	p	8	4

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14. Find a, b and c if its is given that the numbers a, 7, b, 23, c are in an AP.

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15. If m times the m^{th} term of an AP is equal to n times its n^{th} term, show that the $(m+n)^{th}$ term of the AP is zero.

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16. Find the value of k, for which the quadratic equation $(k+4)^2 + (k+1)x + 1 = 0$ has equal roots.

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17. On dividing $\left(x^3 - 3x^2 + x + 2\right)$ by a polynomial g(x), the quotient and remainder are (x-2) and (-2x+4) respectively. Find g(x).

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18. If the sum of the squares of zeroes of the quadractic polynomial f(x) = $x^2 - 8x + k$ is 40, find the value of k.

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19. In what ratio does the point P(-4,y) divide the line segmetn joining the points A(-6,10) and B(3, -8) if its lies on AB. Also, find the value of y.

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20. Prove that a tangent to a circle is perpendicular to the radius throught the point of contact.

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21. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

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22. In a right triangle, prove that the squre of the hypotenuse is equal to the sum of squares of the other two sides.

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23. If $\sin\theta + \cos\theta$ = p and $\sec\theta + \cos ec\theta$ = q. show that $q\left(p^2 - 1\right) = 2p$.

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24. 500 persons are taking a dip into a cuboidal pond which is 80 m long and 50 m broad. What is the rise of the water level in the pond, if the average displacement of the water by a person is $0.04m^3$?

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25. Show that $(12)^n$ cannot end with digit 0 or 5 for any natural number n.

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26. Prove that $\left(\sqrt{2}+\sqrt{5}\right)$ is irrational.

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27. A train covered a certain distance at a uniform speed. If the train would have been $6k\frac{m}{h}r$. Faster it would have taken 4 hours less than the scheduled time and it the train would have slowed down by $6k\frac{m}{h}r$. It would have taken 6 hours more than the scheduled time. find the length of the journey.

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28. If an equilateral triangle ABCD is a point on the side BC such that BD = $\frac{1}{3}$, prove that $9AD^2 = 7AB^2$.

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29. Prove that the sum of squres of the sides of a rhombus is equal to the sum of the squares of its diagonals.

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30. If the angle of elevation of a cloud from a point 10 metres above a lake is s30° and the angle of depression of its reflection in the lake is 60°. Find the height of the cloud from the surface lake.

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31. A vertical tower of height 20 m stands on a horizontal plane and is surmounted by a vertical flag staff of heigh h. At a point on the plane, the angle of elevation of the bottom

and tap of the flaga staff are 45° and 60° respectively. Find the value of h.

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32. A solid iron cuboidal block of dimensions $4.4m \times 2.6m \times 1m$ is cast into a hollow cylindrical pipe of internal radius 30 cm and thickness 5 cm. find the length of the pipe.

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33. For the following frequency distribution, draw a cumulatiave frequency curve of more than type and hence obtain the median value.

Classes	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	5	15	20	23	17	11	9

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