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Mathematics

SOLVED QUESTION PAPERS - 4





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SUBJECT: MATHEMATICS

TIME: 3Hrs

CLASS: X

TOTAL MARKS: 80



 $= \frac{4}{3} \times \frac{22}{7} \times (2.8)^{3}$ $= \frac{4}{3} \times \frac{22}{7} \times 2.8 \times 2.8 \times 2.8$ $= \frac{4}{3} \times 22 \times 2.8 \times 2.8 \times 0.4$ $= \frac{275.968}{3} = 91.99 \text{ cm}^{3}$ 6. If A = 60°, B = 30° then is it right to say sin (A + B) = sin A + sin B? Answer:

Given A = 60°, B = 30° LHS = sin (A + B) = sin (600 + 30°) = sin (90°) = 1 RHS = sin 60° + sin 30° = $\frac{\sqrt{3}}{2} + \frac{1}{2}$ = $\frac{\sqrt{3} + 1}{2}$ LHS ≠ RHS sin (A + B) ≠ sin A + sin B

SECTION – II $(6 \times 4 = 24)$

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7. If $\log (1 + \tan \theta + \sec \theta) + \log (1 + \cot \theta + \csc \theta) = \log k$, then find the value of k. **Answer:**

Given $\log (1 + \tan \theta + \sec \theta) + \log (1 + \cot \theta + \csc \theta) = \log k$

 $\log (1 + \tan \theta + \sec \theta) (1 + \cot \theta + \csc \theta) = \log k$ $(1 + \tan \theta + \sec \theta) (1 + \cot \theta + \csc \theta) = k$ $\left(1 + \frac{\sin \theta}{\cos \theta} + \frac{1}{\cos \theta}\right) \left(1 + \frac{\cos \theta}{\sin \theta} + \frac{1}{\sin \theta}\right) = k$ $\left(\frac{\cos \theta + \sin \theta + 1}{\cos \theta}\right) \left(\frac{\sin \theta + \cos \theta - 1}{\sin \theta}\right) = k$ $\frac{(\cos \theta + \sin \theta)^2 - 1^2}{\sin \theta \cos \theta} = k$ $\frac{\sin^2 \theta + \cos^2 \theta + 2\sin \theta \cos \theta - 1}{\sin \theta \cos \theta} = k$ $\frac{1 + 2\sin \theta \cos \theta}{\sin \theta \cos \theta} = k$ $\frac{2\sin \theta \cos \theta}{\sin \theta \cos \theta} = k$ k = 2

8. Write the formula for mode of a grouped data and explain each term of it.Answer:

Mode = $l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$ Where l = lower boundary of modal class f_0 = frequency of the class preceding the modal class f_1 = frequency of the modal class f_2 = frequency of the class succeeding the modal class h = class size



 $x^{2} + 2x + 1$ divides $x^{4} - 2x^{3} - 4x^{2} + 2x + 3$ exactly





SECTION – III $(4 \times 6 = 24)$

13. Find the mean for the following data

C.I	60 - 70	70 - 80	80 - 90	90 - 100	100 - 110	110 - 120	120 - 130
f	2	5	12	31	36	10	4

Answer:

C.I	f	х	$\mathbf{d}_{\mathrm{i}} = \mathbf{x}_{\mathrm{i}} - \mathbf{a}$	μ_{i}	$f_i \mu_i$
60 - 70	2	65	- 30	- 3	- 6
70 - 80	5	75	- 20	- 2	- 10
80 - 90	12	85	- 10	- 1	- 12
90 - 100	31	95 <mark>(a)</mark>	0	0	0
100 - 110	36	105	10	1	36
110 - 120	10	115	20	2	20
120 - 130	4	125	30	3	12
	$\Sigma f_i = 100$				$\Sigma f_i \mu_i = 40$

 $\overline{x} = a + \frac{\sum f_i \mu_i}{\sum f_i} \times h$ $\overline{x} = 95 + \frac{40}{100} \times 10$ $\overline{x} = 95 + \frac{40}{10}$ = 95 + 4= 99

 \therefore mean of the given data is 99

1+ sinθ $\tan \theta + \sec \theta$ 14. Prove that tan θ

 $-\sec\theta+1$ cosθ

Answer:

 $\tan \theta + \sec \theta - 1$ $\tan \theta + \sec \theta - (\sec^2 \theta - \tan^2 \theta)$ $\tan \theta - \sec \theta + 1$ $\tan \theta - \sec \theta + 1$ $\tan \theta + \sec \theta - (\sec \theta + \tan \theta)(\sec \theta - \tan \theta)$ $\tan \theta - \sec \theta + 1$ $(\tan \theta + \sec \theta)[1 - (\sec \theta - \tan \theta)]$ $\tan \theta - \sec \theta + 1$ $(\tan \theta + \sec \theta) [1 - \sec \theta + \tan \theta)]$ $\tan \theta - \sec \theta + 1$ $= \tan \theta + \sec \theta$ $= \frac{\sin\theta}{\cos\theta} + \frac{1}{\cos\theta}$ $=\frac{1+\sin\theta}{1+\sin\theta}$ cosθ

Hence proved





$$x^{2} = 5n + 4 [Here, n = 5q^{2} + 6q + 1]$$
CASE V:
If we take $r = 4$
 $\Rightarrow a = 5q + 4$
On squaring both sides;
 $= a^{2} = (5q) + 4)^{2}$
 $= a^{2} = (5q) + 4)^{2}$
 $= a^{2} = (5q) + 4(3) + 1$
 $= a^{2} = 5(5q^{2} + 40q + 15 + 1)$
 $= a^{2} = 5(5q^{2} + 40q + 15 + 1)$
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 $= a^{2} = 5(5q^{2} + 40q + 15 + 1)$
Hence, the square of any integer is either of the form 5m, 5m + 1 or 5m + 4 for some integer m.
16. Solve $\frac{2}{x_{1}} + \frac{3}{y_{12}} = 2$ and $\frac{3}{x_{1}} + \frac{3}{y_{21}} = \frac{13}{6}$
Answer:
Given equations are $\frac{2}{x_{1}} + \frac{3}{y_{21}} = 2$ and $\frac{3}{x_{1}} + \frac{2}{y_{21}} = \frac{13}{6}$
 $= 16a + 12b = 13$(2)
Equation (1) × 4 - Equation (2)
 $8a + 12b = 43$
 $= 16a + 12b = 4$
 $16a + 12b = 4$
 $= 16a + 12b +$

Let the points be A(4, -1) and B(-2, -3). Let P (x_1 , y_1) and Q (x_2 , y_2) be the points of trisection of the line segment joining the given points. Then, AP = PC = CBBy Section formula,

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- (v) Mark the midpoint of OP as M.
- (vi) Taking OM or PM as radius draw a circle with M as center.
- (vii) Name the points A and B where the circle with center M intersects the Circle with center O.
- (viii) Join PA and PB.

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RIM	************************************	***************************************	**********************************	
Basics in Mathe	PA	RT – B		in Telugu
Chose the correct answe	er		20	x 1=20
1 The value of k for which	h the system of equativ	and 4y + y = 2and 9y + 2	20 Du — Elchac infinita	// I-20
solutions	in the system of equation	$\sin 4x + y = 5 \sin 0 0x + 2$	Ly – SK has minnte	(c)
a) $\frac{-5}{-5}$	b) $\frac{-6}{-6}$	c) $\frac{5}{-}$	d) 6	
2. Which of the following	statement is not true?	6	5	(c)
a) $\sin \theta = \sqrt{1 - \cos^2 \theta}$		b) $\sec^2 \theta - \tan^2 \theta = 1$		
c) $\cos \theta \times \csc \theta = 1$		d) tan $\theta \times \cot \theta = 1$		
3. The logarithmic form of	of $7^x = 3$ is			(b)
a) $\log_x 3 = 7$	b) $\log_7 3 = x$	c) $\log_3 7 = x$	d) $\log_7 x = 3$	Y
4. The decimal form of $\frac{3}{8}$	is			(d)
a) 3.75	b) 37.05	c) 0.0375	d) 0.375	
5. If 72, 63, 54 is an A	Ari thematic progressi	on, then the term that be	ecomes zero in it is	(c)
a) 11 ^m 6 The equal set of $\Delta = \{x\}$	D) 10 th ty is a letter of the wor	C) 9 ^m cld "FOLLOW"}	d) 8 th	(2)
a) {F, L, O, W}	b){F, L, L, O, W}	c) {F, 0, 0, L, W}	d) {F, O, O, L, L, W	}
7. If $n(A - B) = 5$, $n(B - A)$	$(A) = 7$ and $(A \cap B) =$	= 3, then n (A \cup B) is		, (d)
a) 9	b) 10	c) 12	d) 15	
8. Among the following, th	e value which is not p	ossible for the probabilit	ty of an event is	(d)
a) $\frac{1}{3}$	b) 0.5	c) 25%	d) $\frac{1}{3}$	
9. Among the following, a	linear polynomial is			(a)
a) $3x^2 + 2x - 4$ 10 If $p(x) - x^2 - 2x + 2$ th	b) $2X + 3$	c) 5	d) $x^3 - 3x^2 + 5$	(\mathbf{d})
a) 2	h) 1	03	0 (b	(u)
11. The discriminant of x^2	+x+1=0 is			(b)
a) - 2	b) – 3	c) – 1	d) -4	
12. A quadratic equation v	whose roots are – 2 an	d – 3 is		(b)
a) $X^2 - 5X - 6$ 13 If the product of the 15	b) $X^2 + 5X + 6$ at 5 torms of a CP is 24.	C) X ² + 5X -6 3 then its third side is	d) $x^2 - 5x + 6$	
a) 9	b) 27	c) 3	d) 1	
14. LCM of numbers $2^7 \times$	$3^4 \times 7$ and $2^3 \times 3^4 \times 1$	1 is		(a)
a) $2^7 \times 3^4 \times 7 \times 11$	b) $2^3 \times 3^7 \times 11$	c) $2^3 \times 3^4 \times 7$	d) $2^4 \times 3^7 \times 7$	
15. In an AP n^{th} term is a_n	= a + (n - 1) d, in this	formula 'd' represents	1)	(d)
a) no. of terms 16. If sin $A = \cos A$ (00 < 1	b) common ratio $(4 - 900)$ then the value	c) first term $a of 1 \pm tan A$ is	d) common differ	ence
a) 2	b) 0	c) 3	d) 1	(a)
17. If the radius of a cylind	der is doubled and its l	height is halved, then the	volume of new cyl	inder
formed is				(c)
a) 4 times the value of 1	l st cylinder	b) 3times the va	alue of 1 st cylinder	
c) Ztimes the value of 1 18. If F and \overline{F} are two corr	st cylinder	a) volume rema	$F_{\rm P}(E) = 0.07$ then	tho valuo
of P (\overline{E}) is	ipienieniai y events III	מ זמוועטווו כגףכו ווופוונ. וו	1 (L) = 0.07, mem	(b)
a) 0.83	b) 0.93	c) 0.63	d) 0.83	
19. The mean of 9 observation	ation is 45. In doing so	, if an observation was w	vrongly taken as 42	for 24,
then the correct mean	of the data is	\ 07		(b)
a) 34	b) 43	c) 37	d) 45	aluma af
20. Base radii and heights	s of a cylinder and cone	e ore equal. volume of co	one is 90, then the v	oiume of
a) 27u	b) 37u	c) 9u	d) 36u	(α)
	,	·	,	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
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