MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

SEQUENCES AND SERIES

Exercise

1. 10th term of 4 + 6 + 8 + ... Is

A. 18

B. 20

C. 22

D. 26

Answer: C

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2. nth term of 4 + 9 + 14 + ... is

A. 5n - 1

B. 4n - 1

C. 5n + 1

D. 4n + 1

Answer: A

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3. If the first term of an A.P is - 1 and common difference is - 3, then 12th term is

A. 34

B. 32

C. -32

D. -34

Answer: D

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4. In an A.P, if first term is 4, 9th term is 20, then 15th term is

A. 16

B. 32

C. 18

D. 36

Answer: B

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5. In an A.P, if 16th term is 47 and 31 st term is 92, then 27th term is

A. 80

B. 120

C. 86

D. 116

Answer: A

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6. If 10th term of an A.P is 15 and 15th term is 10, then 4th term is

A. 24

B. 23

C. 22

D. 21

Answer: D

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7. An employee got Rs. 300 per month in his 11 year serivce and got Rs. 495 per month in his 24th year service. If his monthly salary is in A.P., then what is his initial salary ? What is his incriment ?

A. Rs. 200, Rs 10

B. Rs. 300, Rs 10

C. Rs. 150, Rs.20

D. Rs.150, Rs.15

Answer: D

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8. The interior angles of a polygon are in A.P. if the smallest angle is 100° and the common difference is 4° then the number of sides is q

A. 5

B. 7

C. 36

D. 44

Answer: A

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9. Which term of the A.P. 5,2, -1, ... is -22 ?

A. 8

B. 9

C. 10

D. 11

Answer: C

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10. Which term of 11 + 9 + 7 + ... Is - 13

A. 13

B. 12

C. 5

D. 11

Answer: A

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11. The number of numbers that are divisible by 9 between 1,1000 is

A. 101

B. 110

C. 111

D. 100

Answer: C

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12. The number of numbers which are divisible by 7 between 100 and 1000 is

A. 7

B. 128

C. 132

D. 127

Answer: B

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13. Sum of 20 terms of 3 + 5 + 7 + 9 + ...is

A. 410

B. 440

C. 460

D. 220

Answer: B

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14. Sum of first 15 terms of 2 + 5 + 8 + ... Is

A. 44

B. 42

C. 345

D. 386

Answer: C

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15. How many terms are to be added to make the sum 52 in the series (-8) + (-6) + (-4) + ... ?

A. 3

B. 13

C. 12

D. 31

Answer: B

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16. How many terms are added in 24 + 20 + 16 + ... to make the sum 72 ?

A. 6

B. 7

C. 8

D. 9

Answer: D

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17. In an A.P., if common difference is 2, sum to n terms is 49, 7th term is 13, then n =

A. 0

B. 5

C. 7

D. 13

Answer: C

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18. If the sum of the series 24, 20, 16 ..... Is 60 then the number of terms is

A. 0

B. 3

C. 13

D. 25

Answer: B

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19. IF 8th term of an A.P. is 15, then the sum of 15 terms is

A. 15

B. 0

C. 225

D. 225/2

Answer: C

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20. If 10th term of an A.P is 13, then the sum of 19 terms =

A. 26

B. 247

C. 352

D. 1496

Answer: B

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21. If the sum of the first ten terms of an A.P is four times the sum of its five terms, the ratio of the first terms to the common difference is

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

Answer: A

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22. If the sum of the three numbers in A.P is 15 and their product is 45, then the numbers are

A. 1,5,9

B. 1,6,10

C. 2,5,8

D. 3,3,5

Answer: A

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23. If the sum of three numbers which are in A.P is 27 and the product of first and last is 77, then the numbers are

A. 7,9,11

B. 6,9,12

C. 7,10,11

D. none

Answer: A

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24. If the sum of three numbers which are in A.P is 15 and the sum of the squares of the extermes is 58, then those numbers are

A. 3,5,7

B. 2,5,8

C. 3,6,9

D. none

Answer: A

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25. If the sum of four numbers in A.P is 24 and the sum of their square is 164, then those numbers are

A. 3,5,7,9

B. 1,4,7,11

C. 3,4,5,6

D. none

Answer: A

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26. Let T_r be the rth term of an A.P, for r = 1,2 .... If for some positive integers m and n, we have $T_m = \frac{1}{n}$ and $T_n = \frac{1}{m}$, the T_{mn} =

A. $-1/mn$

B. 1/m + 1/n

C. 1

D. 0

Answer: C

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27. If a and x are positive integers such that x $<$ a and $\sqrt{a-x}, \sqrt{x}, \sqrt{a+x}$ are in A.P , then least possible value of a is

A. 5

B. 7

C. 11

D. none of these

Answer: A

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28. If the length of sides of right angled triangle are in A.P., then the sines of the acute angles are

A. 3/5, 4/5

B. $\sqrt{2/3}, \sqrt{1/3}$

C. $\frac{\sqrt{5-1}}{2}, \frac{\sqrt{5+1}}{2}$

D. $\frac{\sqrt{3-1}}{2}, \frac{\sqrt{3+1}}{2}$

Answer: A

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29. If three positive real numbers a,b, c are in A.P such that abc = 4, then the minimum possible value of b is

A. $2^{3/2}$

B. $2^{2/3}$

C. $2^{1/3}$

D. $2^{5/2}$

Answer: B

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30. If $\log_5 2, \log_5(2^x - 5)\log_5(2^x - 7/2)$ are in A.P ., then x =

A. 1/2 or 3/2

B. 3

C. 4 or 5

D. 8

Answer: B

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31. If $a_1, a_2, a_3, \ldots\ldots\ldots$ are in A.P. such that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225,$ then $a_1 + a_2 + a_3 + \ldots\ldots a_{23} + a_{24}$ =

A. 909

B. 75

C. 750

D. 900

Answer: D

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32. Four numbers are in arithmetic progression. The sum of first and last terms in 8 and the product of both middle terms is 15. the least number of the series is

A. 4

B. 3

C. 2

D. 1

Answer: D

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33. The ratio of the sums of m arithmatic means and n arithmatic means between two numbers is

A. $m:n$

B. $n:m$

C. $2m-1:2n-1$

D. none

Answer: A

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34. Between 1 and 31 are inserted m arithmetic means, so that the ratio of the 7th and (m - 1) th means is 5 : 9. then the value of m is

A. 12

B. 13

C. 14

D. 15

Answer: C

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35. If $a_1, a_2 \ldots\ldots\ldots a_n$ are in A.P with common difference d $\neq$ 0, then sum of the series sin d $[\sec a_1 \sec a_2 + \sec a_2 \sec a_3 + \ldots. + \sec a_{n-1} \sec a_n]$

A. $\tan a_n - \tan a_1$

B. $\cot a_n - \cot_a,$

C. $\sec a_n - \sec a_1$

D. $\operatorname{cosec} a_n - \operatorname{cosec} a$

Answer: A

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36. Value of $\lim_{n \to \infty} \sum_{r=1}^{n} \tan^{-1}\left(\frac{1}{2r^2}\right)$ is

A. $\pi/2$

B. $\pi/4$

C. 1

D. none of these

Answer: B

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37. Given that n A.M.s are inserted between two sets of numbers a , 2b and 2a, b where a,b $\in$ R . Suppose further that the mth mean between these sets of numbers is same. Then the ratio a : b =

A. n - m + 1 : m

B. n - m + 1 : n

C. n : n - m + 1

D. m : n - m + 1

Answer: D

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38. If pth, qth, rth terms of an A.P are a,b,c then a(q - r) + b(r - p) + c(p - q) =

A. 0

B. 1

C. a + b + c

D. abc

Answer: A

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39. If mth terms of an A.P . Is n and nth term is m, then (m + n)th term is

A. 0

B. m + n - p

C. m + n

D. mn / (m + n)

Answer: A

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40. If the mth term of an A.P is n and nth term is m , then pth term =

A. m - n + p

B. n - m + p

C. m + n - p

D. m - n - p

Answer: C

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41. If 100 times the 100^{th} term of an A.P with non zero common different equals the 50 times its 50^{th} term, then the 150^{th} term of this AP is

A. 150

B. zero

C. -150

D. 150 times its 50^{th} term

Answer: B

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42. If the sum of m terms of an A.P, is equal to the sum of n terms of the A.P ., then the sum of (m + n) terms is

A. 0

B. m + n - p

C. $m^2 - n^2 + 1$

D. $m^2 + n^2 - 1$

Answer: A

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43. If $a_1, a_2 \ldots\ldots a_n$ are in A.P then $\frac{\sqrt{a_1}+\sqrt{a_n}}{\sqrt{a_1}+\sqrt{a_2}} + \frac{\sqrt{a_1}+\sqrt{a_n}}{\sqrt{a_2}+\sqrt{a_3}} + \ldots\ldots + \frac{\sqrt{a_1}+\sqrt{a_n}}{\sqrt{a_{n-1}}+\sqrt{a_n}} =$

A. n

B. n + 1

C. n - 1

D. 0

Answer: C

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44. If the ratio of sum of n terms in two A.P' s is 2n : n + 1, then the ratio of 8th terms is

A. $15:8$

B. $8:13$

C. $5:17$

D. none

Answer: A

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45. The sum of n terms in two A.P's are in the ratio 3n + 1 : n + 4 , then the ratio of 4th terms is

A. $13:8$

B. $22:11$

C. $27:7$

D. $13:22$

Answer: B

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46. If $S_n$danotes the sum of n terms of n terms of an A.P. then $S_{n+3} - 3S_{n+2} + 3S_{n+1} - S_n =$

A. 0

B. 1

C. 3

D. 2

Answer: A

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47. The first term of an A.P of consecutive integers is $p^2 + 1$. The sum of (2p + 1) terms of this series can be expressed as

A. $(p+1)^2$

B. $(2p+1)(p+1)^2$

C. $(p+1)^3$

D. $p^3 + (p+1)^3$

Answer: D

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48. The numbers $3^{2\sin 20 - 1}$, 14, $3^{4 - 2\sin 20}$ form first three terms of an A.P . Its fifth term =

A. -25

B. -12

C. 40

D. 53

Answer: D

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49. Arithmetic mean of 1/2 & 1/3 is

A. $5/6$

B. $5/12$

C. $12/5$

D. $6/5$

Answer: B

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50. One of the four A,M's between 3, 23 is

A. 6

B. 8

C. 15

D. 21

Answer: C

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51. Sum of 4 Arithmetic means between 3 and 23 is

A. 52

B. 50

C. 48

D. 69

Answer: A

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52. Sum of 14 A.M's between 5 and 8 is

A. $454/5$

B. $456/5$

C. 92

D. 91

Answer: D

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53. If n arithmetic means are inserted between 2 and 38 , then the sum of the resulting series is obtained as 200, then the value of n is

A. 6

B. 8

C. 9

D. 10

Answer: B

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54. If $1, \log_y x, \log_z y, -15\log_x z$ are in A.P ., then

A. $z^3 = x$

B. $x = y^{-1}$

C. $z^{-3} = y$

D. all of the above

Answer: A

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55. If the common difference of an A.P is 1 and 6th term is $\left(4\cos^2\alpha + 1\right)/\cos^2\alpha$, then first term is

A. $\sec^2\alpha$

B. $\tan^2\alpha$

C. $\cot^2\alpha$

D. $\cos ec^2\alpha$

Answer: B

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56. If $S_1, S_2, S_3,$ are the sums of first n natural numbers their squares and their cubes respectively, then $S_3(1 + 8S_1) =$

A. S_2^2

B. $9S_2$

C. $9S_2^2$

D. none

Answer: C

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57. Sum of n terms of $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \ldots.$ is

A. n/(n + 1)

B. (n + 1)/n

C. n/(2n + 1)

D. (2n + 1)/n

Answer: A

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58. Sum of the series S = $1+\frac{1}{2}(1+2)+\frac{1}{3}(1+2+3)+\frac{1}{4}(1+2+3+4)+\ldots\ldots$ upto 20 terms is

A. 110

B. 111

C. 115

D. 116

Answer: C

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59. If $1^2+2^2+3^2+\ldots.+2003^2=(2003)(4007)(334)$ and $(1)(2003)+(2)(2$ (3)(2001)+.....+(2003)(1)=(2003) (334)(x),` then x=

A. 2005

B. 2004

C. 2003

D. 2001

Answer: A

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60. The value of the expression

$$\left(1+\frac{1}{\omega}\right)\left(1+\frac{1}{\omega^2}\right)+\left(2+\frac{1}{\omega}\right)\left(2+\frac{1}{\omega^2}\right)+\left(3+\frac{1}{\omega}\right)\left(3+\frac{1}{\omega^2}\right)+..$$

Where ω is an imaginary cube root of unity, is

A. $\frac{n\left(n^2+2\right)}{3}$

B. $\frac{n\left(n^2-2\right)}{3}$

C. $\frac{n\left(n^2+1\right)}{3}$

D. none of these

Answer: A

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61. If 2nd term of a G.p. is 24 and 5th terms is 81 then the first term is

A. 16

B. 18

C. 21

D. 12

Answer: A

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62. If 6th term of a G.P is -1/32 and 9th term is 1/1256, then 11th term =

A. 1024

B. 1/1024

C. 1/256

D. 1/512

Answer: B

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63. Which term of 0.004 + 0.02 + 0.1 + ... Is 12.5 ?

A. 5

B. 6

C. 7

D. 8

Answer: B

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64. Which term of the series 1,2,4,8,..... is 256?

A. 6

B. 9

C. 12

D. 13

Answer: B

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65. Sum of 20 terms of 3 + 6 + 12 + ... Is

A. $3\left(3^{20}-1\right)/2$

B. $3\left(2^{19}-1\right)/2$

C. $3\left(2^{20}-1\right)$

D. $3\left(2^{19-1}\right)$

Answer: C

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66. If nth term of series is 2^n + n, then sum of n terms =

A. $n(2^n - 1) + n(n + 1)$

B. $2(2^n - 1)/2 + n(n + 1)/2$

C. $2(2^n - 1) + n(n + 1)/2$

D. none

Answer: C

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67. If 5th term of a G.P is 32 and common ratio 2, then the sum of 14 terms is

A. 16388

B. 32766

C. 64432

D. none

Answer: B

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68. How many terms of the series 1 + 3 + 9 + ... Sum to 364 ?

A. 5

B. 6

C. 4

D. 3

Answer: B

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69. If (1 - y) (1 + 2x + $4x^2 + 8x^3 + 16x^4 + 32x^5$) = $1 - y^6$, $(y \neq 1)$, then a value of y/x is

A. $1/2$

B. 2

C. $1/4$

D. 4

Answer: B

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70. In a geometric progression consisting of positive terms each term equals the sum of the next two terms. Then the common ratio of this progression equals

A. $\frac{1}{2}(1 - \sqrt{5})$

B. $\frac{1}{2}\sqrt{5}$

C. $\sqrt{5}$

D. $\frac{1}{2}(\sqrt{5}-1)$

Answer: D

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71. $1+(0.04)+(0.04)^2+\ldots.\infty$ =

A. 1

B. 0.04

C. 25/24

D. 24/25

Answer: C

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72. If $|x| < 1, y = x - x^2 + x^3 - x^4 + \ldots\ldots$, the value of x in terms of y is

A. $\frac{y}{y+1}$

B. $\frac{y}{y-1}$

C. $\frac{y}{1-y}$

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

Answer: C

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73. If $x = 1 + a + a^2 + \ldots\ldots\infty$, $y = 1 + b + b^2 + \ldots\ldots\infty$, $|a| < 1, |b| < 1$, then $1 + ab + a^2b^2 + \ldots\ldots\infty =$

A. $\frac{xy}{x+y-1}$

B. $\frac{x+y-1}{xy}$

C. $\frac{xy}{x+y+1}$

D. $\frac{x+y+1}{xy}$

Answer: A

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74. If $x=\sum_{n=0}^{\infty} a^n, y=\sum_{n=0}^{\infty} b^n, z=\sum_{n=0}^{\infty} c^n$ where a,b,c are in A.P . And $|a|<1, |b|<1, |c|<$, then x,y,z, are in

A. G.P

B. A.P.

C. Arithmetic - Geometric Progression

D. H.P.

Answer: D

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75. If exp{ $(\sin^2 x + \sin^4 x + \sin^6 x + \ldots . \text{Upto} \infty) \log_e 2$ } satisfies the equation $x^2 - 17x + 16 = 0$ then the value of $\frac{2\cos x}{\sin x + 2\cos x} (0 < x < \pi/2)$ is

A. $1/2$

B. $3/2$

C. $5/1$

D. none of these

Answer: A

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76. If exp $\{(\tan^2 x - \tan^4 x + \tan^8 x - \tan^6 x \ldots .) \log_e 16\}$, $0 < x < \pi/4$, satisfies the quadratic equation $x^2 - 3x + 2 = 0$, then value of $\cos^2 x + \cos^4 x$ is

A. $4/5$

B. $21/16$

C. $\frac{17}{11}$

D. $19/31$

Answer: B

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77. For $0 < x < \pi$ the values of x which satisfy the relation

$9^{1+|\cos x|+|\cos^2 x|+\cos^3 x|+\ldots.\text{upto}\,\infty} = 3^4$ are given by

A. $\pi/3, 2\pi/3$

B. $\pi/3, 3\pi/4$

C. $\pi/4, 3\pi/4$

D. none of these

Answer: A

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78. Given that $0 < x < \frac{\pi}{4}, \frac{\pi}{4} < y < \frac{\pi}{2}$ and $\sum_{k=0}^{\infty}(-1)^k \tan^{2k} x = p, \sum_{k=0}^{\infty}(-1)^k \cot^{2k} y =$

then

$\sum_{k=0}^{\infty} \tan^{2k} x \cot^{2k} y$ is

A. $\frac{1}{p} + \frac{1}{q} - \frac{1}{pq}$

B. $\frac{1}{\frac{1}{p} + \frac{1}{q} - \frac{1}{pq}}$

C. p + q - pq

D. p + q + pq

Answer: B

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79. The coefficient of x in $\left(x^2 + \frac{c}{x}\right)^5$ is

A. 15

B. 20

C. 6

D. none

Answer: A

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80. $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\ldots..=x, \frac{1}{3}+\frac{1}{9}+\frac{1}{27}+\frac{1}{81}+\ldots=y,$ then

A. x = y

B. 2x + 4y = 4

C. $x^2 = y$

D. x + y = 0

Answer: B

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81. the sum to infinity of $\frac{1}{7}+\frac{2}{7^2}+\frac{1}{7^3}+\frac{2}{7^4}+\ldots.$ is

A. $1/5$

B. $7/24$

C. $5/48$

D. $3/16$

Answer: D

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82. The sum of an infinite G.P. is 2. If the sum of their squares is 4/3, then the third term is

A. $1/2$

B. 1

C. 1/4

D. 10

Answer: A

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83. The least value of n for which $1 + 2 + 2^2 + \ldots\ldots$ to n terms is greater than 1000 is

A. 7

B. 8

C. 9

D. 10

Answer: D

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84. If x > 0, and $\log_2 + \log_2\left(\sqrt{x}\right) + \log_2\left(4\sqrt{x}\right) + \log_2\left(8\sqrt{x}\right) + \log_2\left(16\sqrt{x}\right) + \ldots\ldots = 4$ then x =

A. 2

B. 3

C. 4

D. 5

Answer: C

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85. If (1 + 3 + 5 + ... +P) + (1 + 3 + 5 + ... Q) = (1 + 3 + 5 + ... r) where each set of parentheses contains the sum of consecutive odd integers as shown, the smallest possible value of p + q + r, is

A. 12

B. 21

C. 45

D. 54

Answer: B

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86. The greatest value on n so that $1 + 5 + 5^2 + 5^3 + \ldots . N$ terms is less than 4321 is

A. 6

B. 7

C. 8

D. 9

Answer: A

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87. 7 + 77 + 777 + ... N terms =

A. $70(10^n - 1)/81 - 7n/9$

B. $7(10^n - 1)/81 - 7n/9$

C. $7(10^n - 1) - 7n/9$

D. none

Answer: A

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88. 6 + 66 + 666 + ...n terms =

A. $20(10^n - 1)/27 - 2n/3$

B. $20(10^n - 1)/81 - 2n/9$

C. $60(10^n - 1)/27 - 2n/3$

D. none

Answer: A

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89. The sum to n terms of the series .5 + .55 + .555 + ... Is

A. $\frac{5n}{9} - \frac{5}{81}\left(1 - \frac{1}{10^n}\right)$

B. $\frac{5n}{9} + \frac{5}{81}\left(1 - \frac{1}{10^n}\right)$

C. $\frac{5n}{9} - \frac{5}{81}\left(\frac{1}{10^n} - 1\right)$

D. none

Answer: A

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90. 7 + 77 + 777 + ... N terms =

A. $\frac{7n}{9} - \frac{7}{81}\left(1 - \frac{1}{10^n}\right)$

B. $\frac{7(10^n-1)}{9}-\frac{7n}{81}$

C. $\frac{70(10^n-1)}{81}-\frac{7n}{9}$

D. none

Answer: A

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91. The sum of first 20 terms of the sequence 0.7, 0.77, 0.777,..... Is

A. $\frac{7}{81}\left(179+10^{-20}\right)$

B. $\frac{7}{9}\left(99+10^{-20}\right)$

C. $\frac{7}{81}\left(179-10^{-20}\right)$

D. $\frac{7}{9}\left(99-10^{-20}\right)$

Answer: A

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92. The value of n for which 704 + $\frac{1}{2}(704) + \frac{1}{4}(704) +$ ..... Upto n terms = 1984 - $\frac{1}{2}(1984) + \frac{1}{4}(1984)$ .... Upto n terms is

A. 5

B. 4

C. 4

D. 10

Answer: A

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93. The positive integer n for which $2 \cdot 2^2 + 3.2^3 + 4.2^4 +$ ..... n . $2^n = 2^{n+10}$ is

A. 510

B. 511

C. 512

D. 513

Answer: D

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94. $(666\ldots Ndigits)^2$ + (888 .... N digits) =

A. $\frac{4}{9}(10^n - 1)$

B. $\frac{4}{9}(10^{2n} - 1)$

C. $\frac{4}{9}(10^n - 1)^2$

D. none of these

Answer: B

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95. If the sum of three numbers in a G.P is 26 and the sum of products two at a time is 156, then the numbers are

A. 2,6,18

B. 1,8,64

C. 1,5,25

D. 1,4,1

Answer: A

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96. If $0 < \phi < \pi/2$, and $x = \sum_{n=0}^{\infty} \cos^{2n}\phi, y = \sum_{n=0}^{\infty} \sin^{2n}\phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n}\phi$

then

A. xyz = xz + y

B. xyz = xy + z

C. $xyz = x + y + z$

D. $xyz = yz + zx$

Answer: A

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97. If the sum of three numbers in G.P is 21 and their product is 216, then the numbers are

A. 3,6,12

B. 2,4,8

C. 5,7,9

D. none

Answer: A

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98. If the sum of three numbers in G.P is $\frac{7}{64}$ and the product of the extremes is $\frac{1}{1024}$ then the numbers are

A. $\frac{1}{64}, \frac{1}{32}, \frac{1}{16}$

B. $16, 32, 64$

C. $\frac{1}{8}, \frac{1}{16}, \frac{1}{32}$

D. none

Answer: A

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99. If pth, qth, rth terms of an A.P are a,b,c then a(q - r) + b(r - p) + c(p - q) =

A. 0

B. 1

C. pqr

D. abc

Answer: A

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100. Let $S_1, S_2, S_3, \ldots$. Are squares such that for each $n \geq 1,$ The length of the side of S_n is equal to length of diagonal of S_{n+1}. If the length of the side S_1 is 10 cm then for what value of n, the area of S_n is less than 1 sq.cm.

A. 7

B. 8

C. 9

D. 10

Answer: B

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101. In G.P (p + q)th term is m, (p -q)th term is n, then pth terms is

A. nm

B. $\sqrt{nm}$

C. m/n

D. $\sqrt{m/n}$

Answer: B

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102. If 2pth term of a G.P is q^2 and 2qth term is P^2 , then (p + q)th term is

A. 0

B. 1

C. p + q

D. pq

Answer: D

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103. If g_1, g_2, g_3 are three geometric means between two positive numbers a,b then $g_1 g_3$ =

A. g_2

B. g_2^2

C. $2g_2$

D. $2g_2^2$

Answer: B

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104. What is the G.M. of 6 and 24?

A. 12

B. 15

C. 13

D. 30

Answer: A

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105. One of the 5 geometric means between $\frac{1}{3}$ and 243 is

A. 79

B. 80

C. 81

D. 82

Answer: C

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106. If x,y,z are the three geometric means between 6,54, then z =

A. $9\sqrt{3}$

B. 18

C. $18\sqrt{3}$

D. 27

Answer: C

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107. IF the A.M and G.M of two numbers are 13 and 12 respectively. Find the numbers.

A. 8,12

B. 8,18

C. 10,18

D. 12,18

Answer: B

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108. Let x be the arithmetic mean y,z be the two geometric means between any two positive numbers. Then value of $\frac{y^3+z^3}{xyz}$ is

A. 2

B. 3

C. $1/2$

D. $3/2$

Answer: A

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109. 10th term of the hearmenie progression is $\frac{2}{1}+2\frac{1}{2}+3\frac{1}{3}+$ is

A. $2/5$

B. $-5/2$

C. $5/2$

D. $-2/5$

Answer: B

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110. If the fourth term of a H.P is 1/3 and 7th term is 1/4, then 16th term is

A. $1/5$

B. $1/6$

C. $1/7$

D. $1/8$

Answer: C

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111. If the third and seventh terms of a H.P. are 1/7, 1/15 respectively, then nth term is

A. 2n + 1

B. 1/(2n + 1)

C. 2n -1

D. 1/(2n - 1)

Answer: B

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112. If mth terms of H.P is n and nth term is m, then (m + n)th term is

A. 0

B. 1

C. -1

D. $\frac{mn}{m+n}$

Answer: D

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113. If a,b,c are in H.P and ab + bc ca = 15, then ca =

A. 5

B. 7

C. 9

D. 10

Answer: A

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114. If $a_1, a_2, \ldots a_n$ are in H.P. then $a_1.\, a_2 + a_2.\, a_3 + a_3.\, a_4 + \ldots + a_{n-1}.\, a_n$=

A. na_1a_n

B. $(n-1)a_1a_n$

C. $n(a_1 - a_n)$

D. $(n-1)(a_1 - a_n)$

Answer: B

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115. The cotangents of the angles $\pi/3, \pi/4, \pi/6$ are in

A. A.P.

B. G.P

C. H.P

D. A.G.P

Answer: B

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116. If three are four harmonic means between 1/12, 1/42, then the third harmonic mean is

A. $1/8$

B. $1/24$

C. $1/30$

D. $1/36$

Answer: C

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117. Two harmonic means between 1/2, 4/17 are

A. $4/11, 2/7$

B. 11/4,7/2

C. 4/7,2/11

D. 7/4,11/2

Answer: A

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118. H_1, H_2 are 2 H.M.'s between a,b then $\frac{H_1 + H_2}{H_1 . H_2} =$

A. $\frac{a . b}{a + b}$

B. $\frac{a + b}{ab}$

C. $\frac{a - b}{ab}$

D. $\frac{ab}{a - b}$

Answer: B

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119. Let $a_1, a_2, \ldots, a_{10}$ be in A.P and $h_1, h_2, \ldots, h_{10}$ be I H.P if $a_1 = h_1 =$ 2 and $a_{10} = h_{10} = 3$, then $a_4 h_7$ is

A. 2

B. 3

C. 5

D. 6

Answer: D

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120. If the arthimetic mean between a and b is $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$, then n =

A. 0

B. 1

C. -1

D. $1/2$

Answer: A

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121. If the geometic mean between a and b is $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$, then n

A. 0

B. $1/2$

C. $-1/2$

D. $1/2$

Answer: C

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122. If the harmonic mean between a and b is $\frac{a^{n+1}+b^{n-1}}{a^n+b^n}$, then n =

A. 0

B. -1

C. $-1/2$

D. 1

Answer: B

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123. x,y are two real numbers. If A is half of their sum, G is root of their product and H is average of their reciprocls then

A. A.H = G^2

B. G = A.H

C. A = HG^2

D. A = G + H

Answer: A

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124. If the first and (2n + 1)th terms of an A.P. , G.P. and H.P. are equal and their (n + 1)th terms are a, b and c respectively, then

A. $a > b > c$

B. $ac = b^2$

C. a + b = c

D. none of these

Answer: B

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125. If $H_1, H_2, \ldots . H_n$ are n harmonic means between a and b ($\neq$ a), then the value of $\frac{H_1 + a}{H_1 - a} + \frac{H_n + b}{H_n - b}$

A. n + 1

B. n - 1

C. 2n

D. 2n + 3

Answer: C

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126. The harmonic mean of two numbers is 4 their arithmetic mean is A and geometric mean is G. if G satisfies 2A + $G^2 = 27,$ the numbers are

A. 1, 13

B. 9 ,12

C. 3, 6

D. 4 ,8

Answer: C

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127. The ratio of the harmonic mean to the geometric mean of two positive numbers is 12/13. the numbers are in the ratio

A. $12/13$

B. $13/12$

C. $4/3$

D. $4/9$

Answer: D

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128. If b + c, c + a , a + b are in A.P then a , b , c are in

A. A.P

B. G.P

C. H.P

D. none

Answer: A

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129. If a^2, b^2, c^2 are in A.P., then $\frac{a}{b+c}, \frac{b}{c+a}, \frac{c}{a+b}$ are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: A

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130. IF the roots of $(b-c)x^2+(c-a)x+(a-b)=0$ are equal then a, b,c are in

A. A.P

B. G.P

C. H.P

D. none

Answer: A

Watch Video Solution

131. IF the roots of $a(b-c)x^2+b(c-a)x+c(a-b)$=0 are equal then a, b, c are in

A. A.P

B. G.P

C. H.P

D. none

Answer: C

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132. If the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals, then a/c, b/a and c/b are in

A. Geometric Progression

B. Harmonic Progression

C. Arithmetic - Geometric Progression

D. Arithmetic Progression

Answer: B

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133. If the system of linear equations $x + 2ay + az = 0, x + 3by + bz = 0, x + 4ch + cz = 0$ has a non zero solution then a,b,c

A. are in G.P.

B. are in H.P

C. Satisfy a + 2b + 3c = 0

D. are in A.P.

Answer: B

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134. Let f (x) be a polynomial function of second degree. If f (1) = f(-1) and a,b,c are in A.P., then f' (a), f'(c) are in

A. G.P

B. H.P

C. A.G.P

D. A.P

Answer: D

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135. If $x > 1, y > 1, z > 1$ are in G.P then $\frac{1}{1+\log x}, \frac{1}{1+\log y}, \frac{1}{1+\log z}$ are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: C

Watch Video Solution

136. If $\frac{a+bx}{a-bx}=\frac{b+cx}{b-cx}=\frac{c+dx}{c-dx}(x\neq 0),$ then a ,b ,c ,d are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: B

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137. If $a^x=b^y=c^z=d^t$ and a ,b ,c d are in G.P . Then x, y, z, t are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: C

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138. If a,b and c are in G.P then $\frac{b-a}{b-c}+\frac{b+a}{b+c}$

A. b^2-c^2

B. ac

C. ab

D. 0

Answer: D

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139. If a,b,c are unequal numbers such that a,b,c are in A.P and b - a, c - b, a are in G.P., then a : b : c is

A. $1:2:3$

B. $1:3:5$

C. $2:3:4$

D. $1:2:4$

Answer: A

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140. If 2(y - a) is the H.M between y - x and y - z, then x - a, y -a, z - a are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: B

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141. Suppose a, b, c are positive resl numbers different from 1. If $\log_a 100, 2\log_b 10, 2\log_c 5 + \log_c 4$ are in H.P., then a, b , c are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: B

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142. If $\frac{1}{a^2}, \frac{1}{b^2}, \frac{1}{c^2}$ are in H.P., then

A. a^2, b^2, c^2 are in G.P

B. a^2, b^2, c^2 are in H.P

C. b + c, c + a , a + b are in A.P

D. $\frac{1}{b+c}\frac{1}{c+a}, \frac{1}{a+b}$ are in A.P

Answer: D

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143. If b +c, c + a, a + b are in H.P then

A. a, b, c are in A.P

B. a^2, b^2, c^2 are H.P

C. a^2, b^2, c^2 are in A.P

D. a^2, b^2, c^2 are in G.P

Answer: C

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144. If a, 8, b are in A.P, a, 4 , b are in G.P, a , x, b are in H.P then x =

A. 2

B. 1

C. 4

D. 16

Answer: A

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145. Three positive numbers form an increasing G.P. if the middle term in this G.P is doubled, the new numbers are in A.P then the common ratio of the G.P. is

A. $2 - \sqrt{3}$

B. $2 + \sqrt{3}$

C. $\sqrt{2} + \sqrt{3}$

D. $3 + \sqrt{2}$

Answer: B

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146. If a,b,c are real

A. a = b = c

B. 2b = 3a + c

C. $b^2 = \sqrt{ac/8}$

D. none of these

Answer: A

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147. If p,q,r are three positive real numbers then the value of (p + q) (q + r) (r + p) is

A. $>$ 8 pqr

B. $<$ 8 pqr

C. 8pqr

D. 8(p + q + r)

Answer: A

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148. Suppose a, b, c are in A.P and a^2, b^2, c^2 are in G.P if a $< b < c$ and a + b + c = 3/2 then the value of a is

A. $\frac{1}{2\sqrt{2}}$

B. $\frac{1}{2\sqrt{3}}$

C. $\frac{1}{2}-\frac{1}{\sqrt{3}}$

D. $\frac{1}{2}-\frac{1}{\sqrt{2}}$

Answer: D

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149. If $I_n=\int_0^{\pi/4}\tan^n x dx$ then $I_2+I_4, I_3+I_5, I_4+I_6\ldots..$ are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer: C

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150. If a,b,c are in A.P., p,q,r are in H.P and ap, bq, cr are in G.P., then $\frac{p}{r}+\frac{r}{p}=$

A. $\frac{a}{c}+\frac{c}{a}$

B. $\frac{a}{c}-\frac{c}{a}$

C. $\frac{b}{q}+\frac{q}{b}$

D. $\frac{b}{q}-\frac{a}{p}$

Answer: A

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151. If a $\left(\frac{1}{b}+\frac{1}{c}\right), b\left(\frac{1}{c}+\frac{1}{a}\right), c\left(\frac{1}{a}+\frac{1}{b}\right)$ are in A.P., then

A. $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in G.P.

B. $a, b, c$are in H.P

C. $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P

D. a,b,c are in A.P

Answer: D

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152. If a,b,c are in H.P., then the straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through a fixed point and that point is

A. $(-1,-2)$

B. $(-1,2)$

C. $(1,-2)$

D. $(1,-1/2)$

Answer: C

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153. If x,y,z are in A.P and $\tan^{-1} x, \tan^{-1} y$ and $\tan^{-1} z$ are also in A.P., then

A. 6x = 3y = 2z

B. 6x =4y = 3z

C. x = y = z

D. 2x = 3y = 6z

Answer: C

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154. The sum of the series $1 + \frac{5}{2} + \frac{9}{4} + \frac{13}{8} + \ldots\ldots$ is

A. $\frac{1003}{256}$

B. $\frac{997}{256}$

C. $\frac{1003}{128}$

D. $\frac{997}{128}$

Answer: A

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155. The sum of the series $1 + \frac{5}{2} + \frac{9}{4} + \frac{13}{8} + \ldots..$ is

A. 8

B. 9

C. 10

D. 11

Answer: C

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156. If $(10)^9 + 2(11)^1(10)^8 + 3(11)^2(10)^7 + \ldots. + 10(11)^9 = k(10)^9$, then k is equal to

A. 100

B. 110

C. $\frac{121}{10}$

D. $\frac{441}{100}$

Answer: A

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