MATHS

BOOKS - HT Olympiad Previous Year Paper

ARITHMETIC PROGRESSIONS

Mathematical Reasoning

1. If the 9th term of an A.P. is zero, then prove that 29th term is double of 19th term.

A. Thrice of

B. Twice of

C. Half of

D. Equal to

Answer: B

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2. Find the value of x for which $(8x + 4),\ (6x - 2)$ and $(2x + 7)$ are in A.P.

A. $\dfrac{15}{2}$

B. $\dfrac{2}{15}$

C. $-\dfrac{15}{2}$

D. $-\dfrac{2}{15}$

Answer: A

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3. In an A.P., the sum of first n terms is $\dfrac{3n^2}{2} + \dfrac{13}{2}n$. Find its $25th$ term.

A. 80

B. 120

C. 60

D. 78

Answer: A

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4. Which term in the A.P. 5,2,-1,... is -22 ?

A. 9

B. 11

C. 10

D. 7

Answer: C

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5. v45

A. 15

B. 25

C. 18

D. 10

Answer: A

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6. If the pth term of an A.P. is q and the qth term

is p, prove that its $n^{th} term is (p + q - n)$.

A. $p + q - n$

B. $p + q + n$

C. $p - q + n$

D. $p - q - n$

Answer: A

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7. If $x \neq y$ and the sequences x, a_1, a_2, y and x, b_1, b_2 , y each are in A.P., then $\dfrac{a_2 - a_1}{b_2 - b_1}$ is

A. $\dfrac{2}{3}$

B. $\dfrac{3}{2}$

C. 1

D. $\dfrac{3}{4}$

Answer: C

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8. If the ratio of the sums of m and n terms of A.P. is $m^2 : n^2$, then the ratio of its mth and n^{th} terms is given by

A. $(2m + 1) : (2n + 1)$

B. $(2m - 1) : (2n - 1)$

C. $2m : n$

D. $m : n$

Answer: B

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9. Four numbers are inserted between the numbers 5 and 95 such that an A.P. results. Find the biggest of these four numbers.

A. 77

B. 85

C. 70

D. 80

Answer: A

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10. The 6th term from the end of the A.P. 5, 2, -1,

-4, ..., -31, is

A. -25

B. -22

C. -19

D. -16

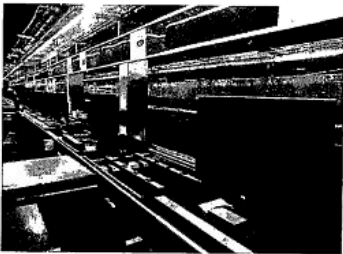**Answer: D**

Everyday Mathematics

1. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward. The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.

Keeping that in mind, a T.V. manufacturing company increases its production uniformly by

fixed number every year. The company produces 8000, sets in the 6th year and 11,300 sets in the 9th year.

The company's total production of the first 6 years is:

    A. 40500

    B. 20000

    C. 20500

    D. 31500

Answer: D

2. Find the sum of first 10 terms of the A.P.

$x - 8, x - 2, x + 4, \ldots$

A. 190 - 10z

B. 10z - 190

C. 190 + 10z

D. 10z + 180

Answer: C

3. Two persons Anil and Happy joined D.W .Associates .Anil and Happy started with an intial salary of Rs 50000 and Rs 64000 respectively with annual increment of Rs 2500 and Rs 2000 each respectively .In which year will Anil start earning more salary than Happy ?

A. 28th

B. 29th

C. 30th

D. 27th

Answer: C

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4. Raghav buys a shop of Rs. 1,20,000. He pays half of the amount in cash and agrees to pay the balance in 12 annual instalments of Rs. 5000 each. If the rate of interest is 12% and the pays with the instalment the interest due

on the unpaid amount, find the total cost of the shop.

A. ₹156800

B. ₹156700

C. ₹165200

D. ₹166800

Answer: D

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5. A thief runs away from a police station with a uniform speed of 100 m/minute. After one minute a policeman runs behind the thief to catch him. He goes at speed of 100 m/minute in first minute and increases his speed 10 m each succeeding minute. After how many minutes, the policeman will catch the thief?

    A. 2 mins

    B. 3 mins

    C. 4 mins

D. 5 mins

Answer: D

Achievers Section Hots

1. Which of the following statements is correct?

(a) Sum of n terms of the list of numbers $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \ldots$ is $\dfrac{n(n+1)}{\sqrt{2}}$.

(b) The common difference of the A.P. given by $a_n = 3n + 2$ is 3.

(c). The sum of the A.P. $(-5), (-8), (-11), ..., (-230)$ is -8930.

A. Only (a)

B. Only (b)

C. Only (a) and (b)

D. (a), (b) and (c)

Answer: D

2. If there are $(2n + 1)$ terms in A.P., then prove that the ratio of the sum of odd terms and the sum of even terms is $(n + 1) : n.$

A. $n : (n + 1)$

B. $(n + 1) : n$

C. $n : (n + 2)$

D. $(n + 2) : n$

Answer: B

3. If $\dfrac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is the A.M. between a and b, then find the value of n.

A. 0

B. 1

C. 2

D. 3

Answer: A

4. The sum of the third and the seventh terms of an A.P. is 6 and the product is 8. Find the sum of first sixteen terms of the A.P

   A. 86

   B. 90

   C. Both (A) and (B)

   D. None of these

Answer: D

5. (i) If the ratio of sum of first n terms of two A.P. s in $(7n + 1) : (4n : 27)$, then ratio of their m^{th} terms is P.

(ii) Sum of n odd natural numbers is Q.

(iii) If sum of first n terms of three A.P.s are S_1, S_2, S_3. The first term of each is 1 and common difference are 1, 2 and 3 respectively, then $\dfrac{S_1 + S_3}{S_2} = $ R.

	P	Q	R
A.	$\dfrac{14m - 6}{8m + 23}$	n^2	2

	P	Q	R
B.	$\dfrac{13m+6}{7m+9}$	n^2	5
	P	Q	R
C.	$\dfrac{14m+6}{8m+23}$	$2n+1$	1
	P	Q	R
D.	$\dfrac{7m+1}{4m+27}$	$2n-1$	3

Answer: A

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