



6. Progressions

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1. A sequence is an arrangement of numbers or objects in a definite order.
2. A sequence a_1, a_2, \dots, a_n is called an arithmetic progression, if there exists a constant " d " such that $a_2 - a_1 = d$, $a_3 - a_2 = d \dots \dots$, $a_{n-1} - a_n = d$. The constant " d " is called the common difference.
3. If a is the first term d the common difference of an A.P, then the A.P is
 $a, a + d, a + 2d \dots$
4. The n^{th} term a_n of an A.P with first term a and common difference d is given by
 $a_n = a + (n - 1)d$
5. The n^{th} term a_n of an A.P with first term a and common difference d . If there exists m terms in that A.P then
 - n^{th} term from the end = $(m - n + 1)^{\text{th}}$ term from the beginning
 - n^{th} term from the end = last term $+(n - 1)(-d)$
6. The sum of the first n terms of an A.P is given by $s_n = \frac{n}{2}(2a + (n - 1)d)$
7. If l is the last term of an A.P, then the sum of all terms of the A.P $s_n = \frac{n}{2}(a + l)$
8. A geometric progression G.P is a list of numbers in which each term is obtained by multiplying preceding term with a fixed number r except first term. This fixed number is called common ratio " r ".
9. The general form of a G.P whose first term is a and common ratio r is
 $a, ar, ar^2, ar^3 \dots$
10. If the first term and common ratio of a G.P are a, r respectively then the n^{th} term $a_n = ar^{n-1}$.

Multiple Choice Questions

- The number of two digit numbers those are divisible by 3
(a)20 (b)30 (c)25 (d)35
- The number of three digit numbers those are divisible by 7
(a)12 (b)13 (c)14 (d)None
- The number of multiples of 4 those lie between 10 and 250 is
(a)60 (b)70 (c)40 (d)80
- If 7th and 13th terms of an A.P be 34 and 64 respectively, then its 18th term is
(a)87 (b)88 (c)89 (d)90
- If the first term of an A.P is 2 and common difference is 4, then the sum of its 40 terms is
(a)3200 (b)1600 (c)200 (d)2800
- The number of terms of the A.P 3, 7,11,15... to be taken so that the sum is 406 is
(a)5 (b)10 (c)12 (d)14
- Sum of "n" terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{32} + \dots$ is
(a) $\frac{n(n+1)}{2}$ (b) $2n(n+1)$ (c) $\frac{n(n+1)}{\sqrt{2}}$ (d)1
- The 9th term of an A.P is 449 and 449th term is 9. The term in A.P which is equal to zero is
(a)501th (b)502th (c)508th (d)None
- If the first term of an A.P is a and n^{th} term is b . Then its common difference is
(a) $\frac{b-a}{n+1}$ (b) $\frac{b-a}{n-1}$ (c) $\frac{b-a}{n}$ (d) $\frac{b+a}{n+1}$
- The sum of first n odd natural number is
(a) $2n - 1$ (b) $2n + 1$ (c) n^2 (d) $n^2 - 1$
- If 18, a , b , -3 are in A.P then $a + b =$
(a)19 (b)7 (c)11 (d)15
- If $\frac{5+9+13+\dots+n \text{ terms}}{7+9+11+\dots+(n+1)\text{ terms}} = \frac{17}{16}$ then $n =$
(a)8 (b)7 (c)10 (d)11
- If in an A.P 11th term is 38 and the 16th term is 73, then the 31st term in that A.P
(a)178 (b)176 (c)175 (d)174
- The n^{th} terms of two A.Ps 63,65,67... and 3,10,17,... are equal then $n =$
(a)10 (b)11 (c)12 (d)13

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15. In an A.P 4th term is $\frac{1}{5}$ and 5th term is $\frac{1}{4}$ then sum of 20 terms in the progression
(a) $\frac{1}{20}$ (b) $\frac{1}{21}$ (c) $\frac{21}{2}$ (d) $\frac{19}{2}$
16. If the sum of first 7 terms of an A.P is 49 and that of 17 terms is 289, then the sum of "n" terms
(a) $(2n + 1)$ (b) n^2 (c) $(2n - 1)$ (d) $(n - 1)^2$
17. If 14 and 18 are the 2nd and 3rd terms of an A.P, then the sum of 51 terms of that A.P is
(a) 5610 (b) 5611 (c) 5612 (d) None
18. The n^{th} term of a G.P $x, 1, \frac{1}{x}, \dots$
(a) x^n (b) x^2 (c) x^{2-n} (d) None
19. The n^{th} term of a G.P $\sqrt{3}, 3, 3\sqrt{3}, \dots$ is 729 then $n =$
(a) 11 (b) 14 (c) 13 (d) 12
20. The 10th term of a G.P 5, 25, 125
(a) 5^8 (b) 5^9 (c) 5^{10} (d) 5^7
21. The product of 3 numbers in a G.P is 64, then the middle term is
(a) 4 (b) 8 (c) 16 (d) 32
22. Which term of the G.P $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \dots$ Is $\frac{1}{2187}$
(a) 7th (b) 6th (c) 5th (d) None
23. If a, b, c are in A.P and G.P then
(a) $a = b \neq c$ (b) $a \neq b = c$ (c) $a \neq b \neq c$ (d) $a = b = c$
24. 5, $x, y, z, 405$ are in G.P then $y =$
(a) 70 (b) 50 (c) 45 (d) None
25. The n^{th} term of a G.P is $2(0.5)^{n-1}$, then common ratio $r =$
(a) 5 (b) 0.5 (c) $\frac{1}{3}$ (d) 3
26. In a G.P, 3rd term is $\frac{3}{16}$ and 6th term is 24 then 20th term is
(a) $\frac{1}{322}$ (b) $\frac{3}{2047}$ (c) $\frac{2048}{7}$ (d) $\frac{3}{2048}$
27. If p, q, r, s, t, u, v are in A.P, then $q + r + s + t + u =$ _____
(a) $\frac{5}{2}(p + q)$ (b) $\frac{2}{5}(r - p)$ (c) $\frac{5}{2}p$ (d) None
28. Sum of natural numbers between 1 and 101 those are divisible by 2 or 5 is
(a) 1050 (b) 2050 (c) 3050 (d) 4050

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29. $7, 2, a, b, 3$ are in A.P then $a = \underline{\hspace{1cm}}$ and $b = \underline{\hspace{1cm}}$

- (a) 5, 4 (b) 5.2, 4.4 (c) 5.8, 4.4 (d) None

30. In a G.P $\sqrt{3}, \sqrt{6}, 2\sqrt{3}, 2\sqrt{6}, \dots$ then 8th term = $\underline{\hspace{1cm}}$

- (a) $8\sqrt{6}$ (b) $\sqrt{6}$ (c) $7\sqrt{6}$ (d) $13\sqrt{6}$

Answers

1	2	3	4	5	6	7	8	9	10
b	d	a	c	b	d	c	d	b	c
11	12	13	14	15	16	17	18	19	20
d	b	a	d	c	b	d	c	d	c
21	22	23	24	25	26	27	28	29	30
a	a	d	c	b	d	a	c	d	a

