

5. Arithmetic Progressions 2020

1. **If 5, b, c, 14 are the consecutive terms of an A.P., then  $b + c =$  \_\_\_\_\_.**
2. **The next term of A.P.  $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$  is \_\_\_\_\_**
3. **If  $a - b, k, a + b$  and  $x$  are four consecutive terms of an A.P., then find the ratio between  $k$  and  $x$  in terms of  $a$  and  $b$ .**
4. **Find the number of numbers lying between 146 and 300 which are divisible by both 3 and 5.**
5. **The first and the last terms of an A.P. are 16 and 136 respectively. If the common difference of the A.P. is 5, then find the number of terms in the A.P. Also find their sum.**
6. The value of  $x$  for which  $2x, (x + 10)$  and  $(3x + 2)$  are the three consecutive terms of an AP, is
7. The first term of an AP is  $p$  and the common difference is  $q$ , then its  $10^{\text{th}}$  term is
9. Find the sum of first 20 terms of the following AP: 1, 4, 7, 10, ...
10. The sum of four consecutive numbers in AP is 32 and the ratio of product of the first and last terms to the product of two middle terms is 7:15. Find the numbers.
11. The sum of the first 7 terms of an AP is 63 and that of its next 7 terms is 161. Find the AP.
13. The sum of four consecutive numbers in AP is 32 and the ratio of product of the first and last terms to the product of two middle terms is 7:15. Find the numbers.
14. The common difference of the A.P.  $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$  is
15. Show that the sum of all terms of an A.P. whose first term is  $a$ , the second term is  $b$  and the last term is  $c$  is equal to  $\frac{(a + c)(b + c - 2a)}{2(b - a)}$
16. If in an A.P., the sum of first  $m$  terms is  $n$  and the sum of its first  $n$  terms is  $m$ , then prove that the sum of its first  $(m + n)$  terms is  $-(m + n)$ .
17. Find the sum of all 11 terms of an A.P. whose middle term is 30.
18. The  $n^{\text{th}}$  term of the A.P.  $a, 3a, 5a, \dots$  is

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19. Which term of the A.P.  $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$  is the first negative term.
20. The common difference of an AP, whose  $n^{\text{th}}$  term is  $a_n = (3n + 7)$ , is  
(a) 3 (b) 7 (c) 10 (d) 6
21. The value of p for which  $(2p + 1)$ , 10 and  $(5p + 5)$  are three consecutive terms of an AP is  
(a) -1 (b) -2 (c) 1 (d) 2
22. Find the  $11^{\text{th}}$  term from the last term (towards the first term) of the AP  $12, 8, 4, \dots, -84$ .
23. Find a, b and c if it is given that the numbers a, 7, b, 23, c are in AP.
24. If m times the  $m^{\text{th}}$  term of an AP is equal to n times its  $n^{\text{th}}$  term, show that the  $(m + n)^{\text{th}}$  term of the AP is zero.
25. Solve the equation :  $1 + 5 + 9 + 13 + \dots + x = 1326$
26. The first term of an A.P. is 5 and the last term is 45. If the sum of all the terms is 400, the number of terms is  
(A) 20 (B) 8 (C) 10 (D) 16
27. The  $9^{\text{th}}$  term of the A.P.  $-15, -11, -7, \dots, 49$  is  
(A) 32 (B) 0 (C) 17 (D) 13
28. The sum of the First 30 terms of an A.P. is 1920. If the fourth term is 18, find its  $11^{\text{th}}$  term.
29. If the sum of the first 6 terms of an A.P. is 36 and that of the first 16 terms is 256, find the sum of the first 11 terms.
30. If 6 times the  $6^{\text{th}}$  term of an A.P. is equal of 9 times the  $9^{\text{th}}$  term, show that its 15 term is zero.
31. Which of the following is *not* an A.P.?  
(a)  $-1.2, 0.8, 2.8, \dots$  (b)  $3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$   
(c)  $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \dots$  (d)  $\frac{-1}{5}, \frac{-2}{5}, \frac{-3}{5}, \dots$
32. For an A.P., it is given that the first term  $(a) = 5$ , common difference  $(d) = 3$ , and the  $n^{\text{th}}$  term  $(a_n) = 50$ . Find n and sum of first n terms  $(S_n)$  of the A.P.
33. In an A.P. given that the first term  $(a) = 54$ , the common difference  $(d) = -3$ , and the  $n^{\text{th}}$  term  $(a_n) = 0$ . Find n and sum of first n terms  $(S_n)$  of the A.P.
34. Find the sum:  $(-5) + (-8) + (-11) + \dots + (-230)$

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35. Find the sum of the first 100 natural numbers.
36. Show that  $(a - b)^2$ ,  $(a^2 + b^2)$  and  $(a + b)^2$  are in AP.
37. Fill the two blanks in the sequence 2, \_\_\_\_\_, 26, \_\_\_\_\_ so that the sequence forms an A.P
38. A number is chosen at random from the numbers -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5. Then the probability that square of this number is less than or equal to 1 is \_\_\_\_\_
39. If the first three terms of an A.P are b, c and 2b, then find the ratio of b and c
40. If the sum of first m terms of an AP is the same as the sum of its first n terms, show that the sum of its first (m+n) terms is zero.