

Previous Year Boards Questions

Chapter 5 – Arithmetic Progressions

1 Mark:

1. Find the 17th term from the end of the AP: 1, 6, 11, 16 ... 211, 216. **CBSE Sample Paper 2017**
2. What is the common difference of an A.P. in which $a_{21} - a_7 = 84$? **Mathematics 2017 (30/1)**
3. Find the tenth term of the sequence $\sqrt{2}, \sqrt{8}, \sqrt{18}, \dots$ **CBSE Sample Paper 2016**
4. For what value of k will the consecutive terms $2k + 1, 3k + 3$ and $5k - 1$ form an A.P.? **CBSE 2016, Foreign (30/2/1)**
5. Find the 9th term from the end (towards the first term) of the A.P. 5, 9, 13, ... 185. **CBSE 2016, Delhi (30/1/1)**
6. For what value of k will $k + 9, 2k - 1$ and $2k + 7$ are the consecutive terms of an A.P.? **CBSE 2016, Outside Delhi (30/1)**
7. If the common difference of an AP is 3, then what is $a_{15} - a_9$? **CBSE Sample Paper 2015**
8. Find the 25th term of the A.P. $-5, \frac{-5}{2}, 0, \frac{5}{2}, \dots$ **CBSE 2015, Foreign (30/2/1)**
9. If $k, 2k - 1$ and $2k + 1$ are three consecutive terms of an A.P., the value of k is
A) 2 B) 3 C) -3 D) 5
CBSE 2014 (30/1), (30/2), (30/3)
10. The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$ is : **CBSE 2013, Delhi (30/1/1)**
A) p B) $-p$ C) -1 D) 1
11. If the n^{th} term of an A. P. is $(2n + 1)$, then the sum of its first three terms is
A) $6n + 3$ B) 15 C) 12 D) 21
CBSE 2012, Outside Delhi (30/1)
12. The next term of the A. P. $\sqrt{18}, \sqrt{50}, \sqrt{98}, \dots$ is **CBSE 2012, Foreign (30/2/1)**
A) $\sqrt{146}$ B) $\sqrt{128}$ C) $\sqrt{162}$ D) $\sqrt{200}$
13. The sum of first 20 odd natural numbers is: **CBSE 2012, Delhi (30/1/1)**
A) 100 B) 210 C) 400 D) 420
14. If the common difference of an A.P. is 3, then $a_{20} - a_{15}$ is **CBSE 2011 Outside Delhi (30/1)**
A) 5 B) 3 C) 15 D) 20
15. The value of $a_{30} - a_{20}$ for the A.P. 2, 7, 12, 17, ... is **CBSE 2011, Foreign (30/2/1)**
A) 100 B) 10 C) 50 D) 20
16. In an AP, if $d = -2, n = 5$ and $a_n = 0$, then the value of a is **CBSE 2011, Delhi (30/1/1)**
A) 10 B) 5 C) -8 D) 8
17. If the sum of first m terms of an A.P. is $2m^2 + 3m$, then what is its second term? **CBSE 2010, Foreign (30/2/1)**
18. If the sum of first p terms of an A.P., is $ap^2 + bp$, find its common difference. **CBSE 2010, Delhi (30/1/1)**

19. If $\frac{4}{5}, a, 2$ are three consecutive terms of an A.P., then find the value of a .
CBSE 2009, Outside Delhi (30/1)
20. For what value of k , are the numbers $x, 2x + k$ and $3x + 6$ three consecutive terms of an A.P.?
CBSE 2009, Foreign (30/2/1)
21. For what value of p , are $2p - 1, 7$ and $3p$ three consecutive terms of an A.P.?
CBSE 2009, Delhi (30/1/1)
22. The first term of an A.P. is p and its common difference is q . Find its 10th term.
CBSE 2008 (30/2/1), (30/2/2), (30/2/2)
23. Which term of the sequence 114, 109, 104, .. is the first negative term? CBSE Sample Paper I 2008

2 Marks:

1. Find the sum of all natural numbers that are less than 100 and divisible by 4.
CBSE Sample Paper 2017
2. If seven times the 7th term of an A.P. is equal to eleven times the 11th term, then what will be its 18th term?
CBSE 2017, Foreign (30/2/1)
3. Find how many integers between 200 and 500 are divisible by 8. CBSE 2017, Delhi (30/1/1)
4. Which term of the progression $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$ is the first negative term?
CBSE 2017, Outside Delhi (30/1)
5. How many two digit numbers are divisible by 7? CBSE Sample Paper 2016
6. If the ratio of sum of the first m and n terms of an A.P. is $m^2 : n^2$, show that the ratio of its m^{th} and n^{th} terms is $(2m - 1) : (2n - 1)$.
CBSE 2016, Foreign (30/2/1)
7. How many terms of the A.P. 18, 16, 14, ... be taken so that their sum is zero?
CBSE 2016, Delhi (30/1/1)
8. The 4th term of an A.P. is zero. Prove that the 25th term of the A.P. is three times its 11th term.
CBSE 2016, Outside Delhi (30/1)
9. Find the 4th term from the end of the A.P. $-11, -8, -5, \dots, 49$.
CBSE Sample Paper 2015
10. In an AP, if $S_5 + S_7 = 167$ and $S_{10} = 235$, then find the AP, where S_n denotes the sum of its first n terms.
CBSE 2015, Outside Delhi (30/1)
11. The fourth term of an A.P. is 11. The sum of the fifth and seventh terms of the A.P. is 34. Find its common difference.
CBSE 2015, Foreign (30/2/1)
12. Find the middle term of the A.P. 6, 13, 20, ..., 216. CBSE 2015, Delhi (30/1/1)
13. Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.
CBSE 2014 (30/1), (30/2), (30/3)
14. How many three-digit natural numbers are divisible by 7? CBSE 2013 Delhi (30/1/1)
15. How many two-digit numbers are divisible by 3? CBSE 2012, Outside Delhi (30/1)
16. In an AP, the first term is 12 and the common difference is 6. If the last term of the A.P. is 252, find its middle term.
CBSE 2012, Foreign (30/2/1)
17. Find the sum of all three digit natural numbers, which are multiples of 11.
CBSE 2012, Delhi (30/1/1)

18. Find how many two-digit numbers are divisible by 6. **CBSE 2011, Outside (30/1)**
19. Find whether -150 is a term of the AP $17, 12, 7, 2, \dots$? **CBSE 2011, Delhi (30/1/1)**
20. In an AP, the first term is -4 , the last term is 29 and the sum of all its terms is 150 . Find its common difference. **CBSE 2010 Foreign (30/2/1)**
21. In an AP, the first term is 2 , the last term is 29 and sum of the terms is 155 . Find the common difference of the A.P. **CBSE 2010 Delhi (30/1/1)**
22. Which term of the A.P. $3, 15, 27, 39, \dots$ will be 120 more than its 21^{st} term? **CBSE 2009 Outside Delhi (30/1)**
23. The 17^{th} term of an A.P. exceeds its 10^{th} term by 7 . Find the common difference. **CBSE 2009 Foreign (30/2/1)**
24. If S_n , the sum of first n terms of an A.P. is given by $S_n = 3n^2 - 4n$, then find its n^{th} term. **CBSE 2009 Delhi (30/1/1)**

3 Marks:

1. The sum of first six terms of an A.P. is 42 . The ratio of its 10^{th} term to its 30^{th} term is $1 : 3$. Find the first term of the A.P. **CBSE Sample Paper 2017**
2. Find the sum of the following series:
 $5 + (-41) + 9 + (-39) + 13 + (-37) + 17 + \dots + (-5) + 81 + (-3)$. **CBSE 2017, Foreign (30/2/1)**
3. If m^{th} term of an A.P. is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$, then find the sum of its first mn terms. **CBSE 2017, Delhi (30/1/1)**
4. Find the sum of n terms of the series $\left(4 - \frac{1}{n}\right) + \left(4 - \frac{2}{n}\right) + \left(4 - \frac{3}{n}\right) + \dots$ **CBSE 2017, Delhi (30/1/1)**
5. The first term of an A.P. is 5 , the last term is 45 and the sum of all its terms is 400 . Find the number of terms and the common difference of the A.P. **CBSE 2017, Outside Delhi (30/1)**
6. In an A.P., the sum of first n terms is $\frac{3n^2}{2} + \frac{13n}{2}$. Find the 25^{th} term. **CBSE Sample Paper 2016**
7. The ninth term of an A.P. is equal to seven times the second term and twelfth term exceeds five times the third term by 2 . Find the first term and the common difference. **CBSE Sample Paper 2016**
8. Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1^{st} and 4^{th}) to the product of means (2^{nd} and 3^{rd}) is $5 : 6$. **CBSE 2016, Foreign (30/2/1)**
9. If the sum of first 7 terms of an A.P. is 49 and that of its first 17 terms is 289 , find the sum of first n terms of the A.P. **CBSE 2016, Delhi (30/1/1)**
10. If the ratio of the sum of first n terms of two A.Ps is $(7n + 1) : (4n + 27)$, find the ratio of their m^{th} terms. **CBSE 2016, Outside Delhi (30/1)**
11. Find the sum of the two middle most terms of the AP
 $\frac{-4}{3}, -1, \frac{-2}{3}, \dots, 4\frac{1}{3}$ **CBSE Sample Paper 2015**
12. The 14^{th} term of an AP is twice its 8^{th} term. If its 6^{th} term is -8 , then find the sum of its first 20 terms. **CBSE 2015, Outside Delhi (30/1)**

13. In an A.P., if the 12^{th} term is -13 and the sum of its first four terms is 24 , find the sum of its first ten terms.
CBSE 2015, Foreign (30/2/1)
14. If S_n , denotes the sum of first n terms of an A.P., prove that $S_{12} = 3(S_8 - S_4)$.
CBSE 2015, Delhi (30/1/1)
15. The sum of the first seven terms of an AP is 182 . If its 4^{th} and the 17^{th} terms are in the ratio $1:5$, find the AP.
CBSE 2014, Outside Delhi (30/3)
16. The sum of the 2^{nd} and the 7^{th} terms of an AP is 30 . If its 15^{th} term is 1 less than twice its 8^{th} term, find the AP.
CBSE 2014, Outside Delhi (30/2)
17. The sum of the 5^{th} and the 9^{th} terms of an AP is 30 . If its 25^{th} term is three times its 8^{th} term, find the A.P.
CBSE 2014, Outside Delhi (30/1)
18. Find the number of terms of the AP $18, 15\frac{1}{2}, 13, \dots, -49\frac{1}{2}$ and find the sum of all its terms.
CBSE 2013, Delhi (30/1/1)
19. Find the sum of all multiples of 7 lying between 500 and 900 .
CBSE 2012, Outside Delhi (30/1)
20. Find the sum of first 40 positive integers divisible by 6 .
CBSE 2012, Foreign (30/2/1)
21. If 4 times the fourth term of an A. P. is equal to 18 times its 18^{th} term, then find its 22^{nd} term.
CBSE 2012, Foreign (30/2/1)
22. The 17^{th} term of an AP is 5 more than twice its 8^{th} term. If the 11^{th} term of the AP is 43 , then find the n^{th} term.
CBSE 2012, Delhi (30/1/1)
23. Find an A.P. whose fourth term is 9 and the sum of its sixth term and thirteenth term is 40 .
CBSE 2011, Outside Delhi (30/1)
24. Find the sum of first n terms of an A.P. whose n^{th} term is $5n - 1$. Hence find the sum of first 20 terms.
CBSE 2011, Foreign (30/2/1)
25. Find the value of the middle term of the following AP
 $-6, -2, 2, \dots, 58$.
CBSE 2011, Delhi (30/1/1)
26. Determine the AP whose fourth term is 18 and the difference of the ninth term from the fifteenth term is 30 .
CBSE 2011, Delhi (30/1/1)
27. The sum of the first sixteen terms of an A.P. is 112 and the sum of its next fourteen terms is 518 . Find the A.P.
CBSE 2010, Foreign (30/2/1)
28. In an A.P., the sum of first ten terms is -150 and the sum of its next ten terms is -550 . Find the A.P.
CBSE 2010, Delhi (30/1/1)
29. The sum of first six terms of an arithmetic progression is 42 . The ratio of its 10^{th} term to its 30^{th} term is $1:3$. Calculate the first and the thirteenth term of the A.P.
CBSE 2009, Outside Delhi (30/1)
30. If 9^{th} term of an A.P. is zero, prove that its 29^{th} term is double of its 19^{th} term.
CBSE 2009, Foreign (30/2/1)
31. The sum of 4^{th} and 8^{th} terms of an A.P. is 24 and sum of 6^{th} and 10^{th} terms is 44 . Find A.P.
CBSE 2009, Delhi (30/1/1)
32. For what value of n are the n^{th} terms of two A.P.s $63, 65, 67, \dots$ and $3, 10, 17, \dots$ equal?
CBSE 2008 (30/2/1), (30/2/2), (30/2/3)

33. If m times the m th term of an A.P. is equal to n times its n th term, find the $(m + n)$ th term of the A.P.
CBSE 2008 (30/2/1), (30/2/2), (30/2/3)
34. In an A.P., the first term is 8, n th term is 33 and sum to first n terms is 123. Find n and d , the common difference.
CBSE 2008, Foreign (30/2/1)
35. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: Rs. 200 for 1st day,, Rs. 250 for second day, Rs. 300 for third day and so on. If the contractor pays Rs. 27750 as penalty, find the number of days for which the construction work is delayed.
CBSE Sample Paper 2008

4 marks:

- A manufacturer of TV sets produced 600 units in the 3rd year and 700 units in the 7th year. Assuming that, production increases uniformly by a fixed number of units every year. Find
 - The production in 1st year.
 - The production in 10th year.
 - The total production in 7 years.**CBSE Sample Paper 2017**
- If $1 + 4 + 7 + 10 + \dots + x = 287$, find the value of x .
CBSE 2017, Foreign (30/2/1)
- A child puts one five-rupee coin of her saving in the piggy bank on the first day. She increases her saving by one five-rupee coin daily. If the piggy bank can hold 190 coins of five rupees in all, find the number of days she can continue to put the five-rupee coins into it and find the total money she saved. Write your views on the habit of saving.
CBSE 2017, Foreign (30/2/1)
- The ratio of the sums of first m and first n terms of an A.P. is $m^2 : n^2$. Show that the ratio of its m^{th} and n^{th} terms is $(2m - 1) : (2n - 1)$.
CBSE 2017, Delhi (30/1/1)
- If the ratio of the sum of the first n terms of two A.P.s is $(7n + 1) : (4n + 27)$, then find the ratio of their 9th terms.
CBSE 2017, Outside Delhi (30/1)
- The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of youngest boy was 8 years and the ages of rest of participants are having a common difference of 4 months. If the sum of ages of all the participants is 168 years, find the age of eldest participant in the painting competition.
CBSE Sample Paper 2016
- Reshma wanted to save at least ₹ 6,500 for sending her daughter to school next year (after 12 months). She saved ₹ 450 in the first month and raised her saving by ₹ 20 every next month. How much will she be able to save in next 12 months? Will she be able to send her daughter to the school next year? What value is reflected in this question?
CBSE 2016, Foreign (30/2/1)
- A thief runs with a uniform speed of 100 m/minute. After one minute a policeman runs after the thief to catch him. He goes with a speed of 100 m/minute in the first minute and increases his speed by 10 m/minute every succeeding minute. After how many minutes the policeman will catch the thief.
CBSE 2016, Delhi (30/1/1)
- The house in a row are numbered consecutively from 1 to 49. Show that there exists a value of X such that sum of numbers of houses preceeding the house numbered X is equal to sum of the numbers of houses following X .
CBSE 2016, Outside Delhi (30/1)
- Yasmeen saves Rs.32 during the first month, Rs.36 in the second month and Rs.40 in the third month. If she continues to save in this manner, in how many months she will save Rs.2000, which she has intended to give for the college fee of her maid's daughter. What value is reflected here.
CBSE Sample Paper 2015

11. Find the 60^{th} term of the AP 8, 10, 12, ..., if it has a total of 60 terms and hence find the sum of its last 10 terms.
CBSE 2015, Outside Delhi (30/1)
12. Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle term separately.
CBSE 2015, Foreign (30/2/1)
13. Ramkali required ₹ 2500 after 12 weeks to send her daughter to school. She saved ₹ 100 in the first week and increased her weekly saving by ₹ 20 every week. Find whether she will be able to send her daughter to school after 12 weeks. What value is generated in the above situation?
CBSE 2015, Delhi (30/1/1)
14. In a school, students decided to plant trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be double of the class in which they are studying. If there are 1 to 12 classes in the school and each class has two sections, find how many trees were planted by the students. Which value is shown in this question?
CBSE 2014 (30/1), (30/2), (30/3)
15. If the sum of first 7 terms of an AP is 49 and that of first 17 terms is 289, find the sum of its first n terms.
CBSE 2013, Delhi (30/1/1)
16. Find the common difference of an A.P. whose first term is 5 and the sum of its first four terms is half the sum of the next four terms.
CBSE 2012, Outside Delhi (30/1)
17. The sum of 4^{th} and 8^{th} terms of an A.P. is 24 and the sum of its 6^{th} and 10^{th} terms is 44. Find the sum of first ten terms of the A.P.
CBSE 2012, Foreign (30/2/1)
18. Sum of the first 14 terms of an AP is 1505 and its first term is 10. Find its 25th term.
CBSE 2012, Delhi (30/1/1)
19. The first and the last terms of an A.P. are 8 and 350 respectively. If its common difference is 9, how many terms are there and what is their sum?
CBSE 2011, Outside Delhi (30/1)
20. How many multiples of 4 lie between 10 and 250? Also find their sum.
CBSE 2011, Outside Delhi (30/1)
21. In an A.P., if the 6^{th} and 13^{th} terms are 35 and 70 respectively, find the sum of its first 20 terms.
CBSE 2011, Foreign (30/2/1)