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Arithmetic Progressions — CBSE Class 10 Mathematics Chapter Test

FREE CHAPTER TEST · CLASS X · MATHEMATICS (041) · PATTERN OF THE CBSE SAMPLE QUESTION PAPER 2026-27

TIME ALLOWED	MAXIMUM MARKS	QUESTIONS	NAME / ROLL NO.
1½ hours	40	19 (A 10 · B 3 · C 2 · D 2 · E 2)	

GENERAL INSTRUCTIONS

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 19 questions. All questions are compulsory.
2. This question paper is divided into five sections: A, B, C, D and E.
3. In Section A, Questions 1 to 8 are multiple choice questions (MCQs) and Questions 9 and 10 are assertion-reason based questions of 1 mark each.
4. In Section B, Q11–13 are very short answer (VSA) type questions, carrying 2 marks each.
5. In Section C, Q14–15 are short answer (SA) type questions, carrying 3 marks each.
6. In Section D, Q16–17 are long answer (LA) type questions, carrying 5 marks each.
7. In Section E, Q18–19 are case study based questions, carrying 4 marks each, with sub-parts of the values of 1, 1 and 2 marks.
8. There is no overall choice. However, an internal choice has been provided in 1 question of Section B, 1 question of Section C, 1 question of Section D and in the 2-mark sub-part of each question of Section E.
9. Use of calculators is not allowed.
10. This chapter test follows the section structure, question types and marks per question of the CBSE Class X Mathematics (Standard, 041) Sample Question Paper 2026-27, at half the length of the 80-mark board paper: 40 marks in 1½ hours.
11. The answer key and the marking scheme are at the end of this booklet. Attempt the paper in 1½ hours before you look at them.

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Chapter: Arithmetic Progressions · **Topics:** Common difference and nth term · Sum of the first n terms · Term from the end · Finding the AP from conditions · Daily-life problems

SECTION A

This section comprises 10 questions of 1 mark each: 8 multiple choice questions (MCQs) and 2 assertion-reason based questions.

1. The common difference of the AP 3, 7, 11, 15, … is 1

(A) 3 (B) 4

(C) 7 (D) −4

2. The 10th term of the AP 3, 8, 13, … is 1

(A) 48 (B) 53

(C) 46 (D) 51

3. The sum of the first 20 natural numbers is 1

(A) 200 (B) 190

(C) 210 (D) 420

4. Which term of the AP 25, 21, 17, … is −83? 1

(A) 27th (B) 26th

(C) 29th (D) 28th

5. If k, 2k − 1 and 2k + 1 are consecutive terms of an AP, then k is 1

(A) 1 (B) 3

(C) 2 (D) 0

6. The sum of the first n odd natural numbers is 1

(A) $n(n + 1)$ (B) $2n$

(C) n^2 (D) $\frac{n(n + 1)}{2}$

7. For the AP whose nth term is $5n − 2$, the first term and the common difference are 1

(A) 3 and 5 (B) 5 and 3

(C) −2 and 5 (D) 3 and −2

8. How many two-digit numbers are divisible by 3? 1

(A) 33 (B) 31

(C) 29 (D) 30

9. **Assertion (A):** The sum of the first 10 terms of the AP 1, 3, 5, … is 100. 1

Reason (R): The sum of the first n odd natural numbers is n^2.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

10. **Assertion (A):** 1, 4, 9, 16, … is an AP. 1

Reason (R): In an AP, the difference between any two consecutive terms is the same.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

SECTION B

This section comprises 3 very short answer (VSA) type questions of 2 marks each.

11. (a) Find the 11th term from the last term of the AP 9, 5, 1, …, −71. 2

OR

(b) Find the number of terms of the AP 5, 12, 19, …, 194.

12. Find the sum 41 + 38 + 35 + … + 8. 2

13. The sum of the first n terms of an AP is $2n^2 + 7n$. Find its first term and common difference. 2

SECTION C

This section comprises 2 short answer (SA) type questions of 3 marks each.

14. (a) The 15th term of an AP exceeds its 9th term by 18, and its 4th term is 11. Find the AP. 3

OR

(b) How many terms of the AP 21, 18, 15, … must be taken so that their sum is 66?

15. Find the sum of all the multiples of 7 between 1 and 500. 3

SECTION D

This section comprises 2 long answer (LA) type questions of 5 marks each.

16. (a) A school has ₹ 1,350 to give six cash prizes to students for good attendance. Each prize is ₹ 30 less than the one before it. Find the value of each prize. 5

OR

(b) The sum of the 3rd and 7th terms of an AP is 26, and the sum of its 5th and 9th terms is 42. Find its first three terms.

17. Asha saved ₹ 10 in the first week of a year and increased her weekly savings by ₹ 2.50 every week. In which week did her weekly saving become ₹ 40? What were her total savings up to that week? 5

SECTION E

This section comprises 2 case study based questions of 4 marks each, with sub-parts of 1, 1 and 2 marks.

18. An auditorium has 25 rows of seats. There are 20 seats in the first row, and each row has 2 seats more than the row in front of it.

(i) How many seats are there in the 10th row? [1]

(ii) How many seats are there in the last row? [1]

(iii) Find the total number of seats in the auditorium. [2]

OR

(iii) Which row has 50 seats? [2]

19. A factory made 900 electric fans in its 4th year and 1,140 in its 10th year. Its production increases uniformly by a fixed number every year.

(i) Find the yearly increase in production. [1]

(ii) Find the production in the first year. [1]

(iii) Find the production in the 12th year. [2]

OR

(iii) Find the total production in the first 8 years. [2]

END OF THE QUESTION PAPER

ANSWER KEY — SECTION A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
(B)	(A)	(C)	(D)	(B)	(C)	(A)	(D)	(A)	(D)

MARKING SCHEME AND WORKED SOLUTIONS

Marks for each step are shown in brackets, as in the CBSE marking scheme. Any correct alternative method earns full marks.

Q1. Answer (B). $7 - 3 = 4$.

Q2. Answer (A). $a + 9d = 3 + 45 = 48$.

Q3. Answer (C). $20 \times 21/2 = 210$.

Q4. Answer (D). $25 - 4(n - 1) = -83$ gives $n - 1 = 27$, so $n = 28$.

Q5. Answer (B). $2(2k - 1) = k + (2k + 1)$ gives $k = 3$.

Q6. Answer (C). $1 + 3 + \ldots + (2n - 1) = n/2 \times 2n = n^2$.

Q7. Answer (A). $a_1 = 3$, $a_2 = 8$; $d = 5$.

Q8. Answer (D). 12, 15, …, 99: $(99 - 12)/3 + 1 = 30$.

Q9. Answer (A). By R the sum is $10^2 = 100$. Answer (A).

Q10. Answer (D). The differences 3, 5, 7 are not equal: A is false, R is true. Answer (D).

Q11. (2 marks) Answer: (a) −31; (b) 28.
(a) Read backwards: −71, −67, …, an AP with first term −71 and $d = 4$. [1] 11th term $= -71 + 10 \times 4 = -31$. [1]
OR (b) $a = 5$, $d = 7$: $194 = 5 + (n - 1)7$ [1], $n - 1 = 27$, $n = 28$. [1]

Q12. (2 marks) Answer: 294.
$a = 41$, $d = -3$, last term 8: $n = (41 - 8)/3 + 1 = 12$. [1] Sum $= 12/2 \times (41 + 8) = 294$. [1]

Q13. (2 marks) Answer: 9 and 4.
$a_1 = S_1 = 9$. [1] $S_2 = 8 + 14 = 22$, so $a_2 = 22 - 9 = 13$; $d = 4$. [1]

Q14. (3 marks) Answer: (a) 2, 5, 8, …; (b) 4 or 11.
(a) $a_{15} - a_9 = 6d = 18$, so $d = 3$. [1] $a + 3d = 11$, so $a = 2$. [1] AP: 2, 5, 8, 11, … [1]
OR (b) $a = 21$, $d = -3$: $n/2\,[42 - 3(n - 1)] = 66$ [1], so $3n^2 - 45n + 132 = 0$, $n^2 - 15n + 44 = 0$, $(n - 4)(n - 11) = 0$. [1] $n = 4$ or $n = 11$ (the terms from the 5th to the 11th add up to 0). [1]

Q15. (3 marks) Answer: 17892.
7, 14, …, 497: $n = 497/7 = 71$. [1½] Sum $= 71/2 \times (7 + 497) = 71 \times 252 = 17892$. [1½]

Q16. (5 marks) Answer: (a) ₹ 300, 270, …, 150; (b) −3, 1, 5.
(a) The prizes form an AP with $d = -30$, $n = 6$. [1] $S_6 = 6/2\,[2a + 5(-30)] = 1350$ [2], so $2a - 150 = 450$, $a = 300$. [1] Prizes: ₹ 300, 270, 240, 210, 180, 150. [1]
OR (b) $(a + 2d) + (a + 6d) = 26$, so $2a + 8d = 26$; $(a + 4d) + (a + 8d) = 42$, so $2a + 12d = 42$. [2] Subtracting, $4d = 16$, $d = 4$; $a = -3$. [2] First three terms: −3, 1, 5. [1]

Q17. (5 marks) Answer: 13th week; ₹ 325.
$10 + (n - 1) \times 2.50 = 40$ [1], so $(n - 1) \times 2.50 = 30$, $n - 1 = 12$, $n = 13$: the 13th week. [2] Total $= 13/2 \times (10 + 40) = 13 \times 25$ = ₹ 325. [2]

Q18. (4 marks) Answer: (i) 38; (ii) 68; (iii) 1100, or 16th.

(i) $20 + 9 \times 2 = 38$. [1]

(ii) $20 + 24 \times 2 = 68$. [1]

(iii)(a) $S_{25} = 25/2 \times (20 + 68)$ [1] $= 1100$. [1]

OR (iii)(b) $20 + 2(n - 1) = 50$ [1], $n = 16$: the 16th row. [1]

Q19. (4 marks) Answer: (i) 40; (ii) 780; (iii) 1220, or 7360.

(i) $a_{10} - a_4 = 6d = 240$, $d = 40$. [1]

(ii) $a = 900 - 3 \times 40 = 780$. [1]

(iii)(a) $a_{12} = 780 + 11 \times 40$ [1] $= 1220$. [1]

OR (iii)(b) $a_8 = 780 + 7 \times 40 = 1060$; $S_8 = 8/2 \times (780 + 1060)$ [1] $= 7360$. [1]

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