Maths BaseMaker

Class 10 CBSE — Chapter 5: Arithmetic Progressions (AP)

Q1. What is the 11th term of the AP: - -3, -1/2, 2, ...?

(A) 28 (B) 22

(C) -38 (D) 48½

Q2. If the nth term of an AP is given by an = 3n + 5, then its common difference d is:

(A) 3 (B) 5

(C) 8 (D) 2

Q3. Which term of the AP: 21, 18, 15, ... is 0?

(A) 6th (B) 7th

(C) 8th (D) 9th

Q4. The sum of the first 20 odd natural numbers is:

(A) 100 (B) 200

(C) 400 (D) 420

Q5. If k + 2, 4k - 6, and 3k - 2 are three consecutive terms of an AP, then the value of k is:

(A) 3 (B) 2

(C) 4 (D) 5

Q6. Find the 20th term from the last term (towards the first term) of the AP: 3, 8, 13, ..., 253.

Q7. The sum of 10 consecutive terms of an AP is 250. If the first of these 10 terms is 15, find the last term.

Q8. The 17th term of an AP exceeds its 10th term by 7.

1. Find the common difference d.

2. If the first term a = 5, find the sum of the first 15 terms

Q9. If the sum of the first n terms of an AP is given by $S_n = 3n^2 + 5n$, find:

1. The nth term (an).

2. The 15th term (a15).

Q10. A new smartphone model was launched at a price of ₹30,000. Due to regular market price drops, its resale value decreases by a fixed amount of ₹1,500 every month.

(i) What will be the resale value of the phone at the end of the 8th month?

(ii) A student wants to buy this phone second-hand when its price drops to ₹12,000. After how many months will the price reach ₹12,000?

(iii) If a tech enthusiast buys a new unit of this phone every month for the first 10 months, what is the total amount spent on all 10 phones combined?

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Solutions & Answer Key — Class 10 Chapter 5 AP Test Paper

Q1: (B) 22

Solution Hint: First term a = -3, common difference d = -1/2 - (-3) = 5/2.

a11 = a + 10d = -3 + 10(5/2) = -3 + 25 = 22.

Answer: 22

Q2: (A) 3

Solution Hint: Find a1 and a2, then d = a2 - a1.

a1 = 3(1) + 5 = 8, a2 = 3(2) + 5 = 11. d = 11 - 8 = 3.

Answer: 3

Q3: (C) 8th

Solution Hint: a = 21, d = 18 - 21 = -3, an = 0.

0 = 21 + (n-1)(-3) => -21 = -3(n-1) => n-1 = 7 => n = 8.

Answer: 8th

Q4: (C) 400

Solution Hint: Sum of first n odd natural numbers is Sn = n^2.

S20 = 20^2 = 400.

Answer: 400

Q5: (A) 3

Solution Hint: For terms in AP, (T2 - T1) = (T3 - T2).

(4k-6) - (k+2) = (3k-2) - (4k-6) => 3k - 8 = -k + 4 => 4k = 12 => k = 3.

Answer: 3

Q6. Answer: 158

Solution Hint: Reversing the AP makes the last term the first term, with d negated.

1. Realigned AP: 253, 248, 243, ..., 3

2. a = 253, d = -5, n = 20

3. a20 = 253 + (20 - 1)(-5) = 253 - 95 = 158

Answer: 158

Q7. Answer: 12 terms

- **Identify the given values: n = 10, S_n = 250, and first term a = 15.**
- **Hint 2: Use the AP sum formula involving the first and last term: S_n = (n / 2) * (a + l).**

Answer: 35

Q8. Answer: (1) d = 1, (2) S15 = 180

Solution Hint: Use a17 - a10 = 7 to find d, then apply Sn formula.

1. (a + 16d) - (a + 9d) = 7d = 7 => d = 1

2. For a = 5, d = 1, n = 15: S15 = (15/2)[2(5) + 14(1)] = (15/2)(24) = 180

Answer: (1) d = 1, (2) S15 = 180

Q9. Answer: (1) an = 6n + 2, (2) a15 = 92

Solution Hint: an = Sn - Sn-1.

1. S1 = $3(1)^2 + 5(1) = 8$

2. s2 = 22 (sum of 2 terms) …….so AP 8, 14……

3. a15 = 6(15) + 2 = 92

Answer: (1) an = 6n + 2, (2) a15 = 92

Q10. Answer: (1) ₹19,500 | (2) 13 months | (3) ₹2,32,500

Solution Hint: Initial price a = 30000, monthly drop d = -1500.

Part 1: a8 = 30000 + 7(-1500) = 30000 - 10500 = ₹19,500

Part 2: 12000 = 30000 + (n-1)(-1500) => -18000 = (n-1)(-1500) => n = 13 months

Part 3: S10 = (10/2)[2(30000) + 9(-1500)] = 5[60000 - 13500] = 5 * 46500 = ₹2,32,500

Answer: (1) ₹19,500 | (2) 13 months | (3) ₹2,32,500

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