CBSE

ARITHMETIC PROGRESSION WS 1

Class 10 - Mathematics

Section A

1. The value of k for which the numbers x, 2x + k, 3x + 6 are in A.P. is **[1]**

   a) 3 b) 6

   c) 5 d) 4

2. The first three terms of an A.P. respectively are 3y – 1, 3y + 5 and 5y + 1. Then, y equals **[1]**

   a) 2 b) 5

   c) -3 d) 4

3. If x + 1, 3x and 4x + 2 are three consecutive terms of an A.P., then the value of x is: **[1]**

   a) 5 b) 2

   c) 4 d) 3

4. If the angles of a right angled triangle are in A.P. then the angles of that triangle will be **[1]**

   a) 45^o, 45^o, 90^o b) 30^o, 60^o, 90^o

   c) 40^o, 50^o, 90^o d) 20^o, 70^o, 90^o

5. If a, b, c, l, m are in A.P., then the value of a - 4b + 6c - 4l + m is **[1]**

   a) 0 b) 2

   c) 3 d) 1

6. The common difference of the A.P. $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$ ..... is **[1]**

   a) $-\frac{1}{3}$ b) b

   c) -3b d) -b

7. Progressions with equal common difference are known as **[1]**

   a) Geometric Progression b) Mean

   c) Arithmetic Progression d) Harmonic Progression

8. The next two terms of the AP: k, 2k + 1, 3k + 2, 4k + 3, ... are **[1]**

   a) 5k + 4 and 6k + 5 b) 4k + 4 and 4k + 5

   c) 5k + 5 and 6k + 6 d) 5k and 6k

9. If p - 1, p + 1 and 2p + 3 are in A.P., then the value of p is **[1]**

   a) 0 b) 4

   c) 2 d) -2

10. If k, 2k – 1 and 2k + 1 are three consecutive terms of an AP, the value of k is **[1]**

a) 3 b) 6

c) -3 d) -2

11. **Assertion (A):** The constant difference between any two terms of an AP is commonly known as common difference. **[1]**

Reason (R): The common difference of 2, 4, 6, 8 this A.P. is 2.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

12. **Assertion (A):** $\sqrt{3}, 2\sqrt{3}, 3\sqrt{3}, 4\sqrt{3}$ this series forms an A.P. **[1]**

Reason (R): Since common difference is same and equal to $\sqrt{3}$ therefore given series is an AP.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

13. **Assertion (A):** Let the positive numbers a, b, c be in A.P., then $\frac{1}{bc}, \frac{1}{ac}, \frac{1}{ab}$ are also in A.P. **[1]**

Reason (R): If each term of an A.P. is divided by a b c, then the resulting sequence is also in A.P.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

14. Show that the progression 11, 6, 1, -4, -9,... is an A.P. Find its first term and the common difference. **[1]**

15. For the AP: $\frac{3}{2}, \frac{1}{2}, -\frac{1}{2}, -\frac{3}{2}$, ... write the first term a and the common difference d. **[1]**

16. Determine k so that 4k + 8, $2k^2$ + 3k + 6 and $3k^2$ + 4k + 4 are three consecutive terms of an AP. **[1]**

17. Find the common difference of the A.P. and write the next two terms: 75, 67, 59, 51,... **[1]**

18. Find the common difference of the A.P. and write the next two terms: 51, 59, 67, 75,... **[1]**

19. If 18, a, (b - 3) are in AP, then find the value of (2a-b). **[1]**

20. If $\frac{3}{5}$, a, 4 are three consecutive terms of an A.P., then find the value of a. **[1]**

21. Does the sequence 1, 1, 2, 2, 3, 3,... form an AP? Justify your answer. **[1]**

22. For the AP -1.1, - 3.1, -5.1, - 7.1,... write the first term and the common difference. **[1]**

23. Find the common difference of the A.P. $\frac{1}{3q}, \frac{1-6q}{3q}, \frac{1-12q}{3q}, \ldots\ldots$ **[1]**

24. Write the next term of the A.P $\sqrt{2}, \sqrt{8}, \sqrt{18}$, ... **[1]**

25. Show that a - b, a and a + b form consecutive terms of an AP. **[1]**

26. Write the common difference of the A.P.: $\frac{1}{5}, \frac{4}{5}, \frac{7}{5}, \frac{10}{5}$, ... **[1]**

27. Find the common difference of the A.P. and write the next two terms: $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \ldots$ **[1]**

28. Find the common difference of the A.P. and write the next two terms: 119, 136, 153, 170,..... **[1]**

29. Find the value of x for which (x + 2), 2x, (2x + 3) are three consecutive terms of an AP. **[1]**

30. Write the next two terms of the AP: 1, -1, -3, -5,... **[1]**

31. Write first four terms of the AP, when the first term a = -1.5 and the common difference d = -0.5 **[1]**

32. If k, (2k-1) and (2k+ 1) are the three successive terms of an AP, find the value of k. **[1]**

33. Find the value of x for which the numbers (5x+2), (4x-1) and (x+2) are in AP. **[1]**

34. Is the given series 0.2, 0.22, 0.222, 0.2222,..... form an AP? If It forms an AP, then find the common difference d and write the next three terms. **[1]**

35. For what value of k will the consecutive terms 2k + 1, 3k + 3 and 5k - 1 form an A.P.? **[1]**

36. Does the sequence 11, 22, 33,.. form an AP? Justify your answer. **[1]**

37. Write an A.P. whose first term is 10 and common difference is 3. **[1]**

38. Does the sequence $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots$ form an AP? Justify your answer. **[1]**

39. For the following APs, write the first term and the common difference : 3, 1, –1, –3, …. **[1]**

40. If the numbers (2n -1), (3n + 2) and (6n-1) are in AP, find n and hence find these numbers. **[1]**

41. If (2p - 1), 7, 3p are in A.P, find the value of p. **[1]**

42. If $\frac{4}{2}$, a, 2 are in AP, find the value of a. **[1]**

43. If 3y - 1, 3y + 5 and 5y + 1 are three consecutive terms of an A.P., then find the value of y. **[1]**

44. Does the sequence –1, –1, –1, –1, ... form an AP? Justify your answer. **[1]**

45. The fee charged from a student every month by a school for the whole session, when the monthly fee is Rs 400. Do the lists of numbers involved form an AP? Give reasons for your answer. **[1]**

46. Show that the progression 8, 11, 14, 17, 20, ... is an A.P. Find its first term and the common difference. **[1]**

47. For the AP 0.6, 1.7, 2.8, 3.9 ....., write the first term and the common difference. **[1]**

48. For the AP $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \ldots\ldots$, write the first term and the common difference. **[1]**

49. The taxi fare after each km when the fare is ₹ 15 for the first km and ₹ 8 for each additional km. Is this situation make an arithmetic progression and why? **[1]**

50. For the AP –5, –1, 3, 7,... write the first term and the common difference. **[1]**

51. Write the first four terms of the AP, when the first term a = -1 and the common difference d = $\frac{1}{2}$ **[1]**

Section B

52. The cost of digging a well after every metre of digging, when it costs ₹ 150 for the first metre and rises by ₹ 50 for each subsequent metre. Is this situation make an arithmetic progression and why? **[3]**

53. The amount of money in the account every year, when ₹ 10000 is deposited at compound interest at 8% per annum. Is this situation make an arithmetic progression and why? **[3]**

54. Find the value of a, b and c such that the numbers a, 7, b, 23 and c are in A.P. **[3]**

55. The amount of air present in a cylinder when a vacuum pump removes $\frac{1}{4}$ of the air remaining in the cylinder at a time. Is this situation make an arithmetic progression and why? **[3]**

56. Is the sequence 3, 6, 12, 24,... an arithmetic progression. If yes, find out the common difference. **[3]**

Section C

57. The cost of digging a well for the first metre is ₹150 and rises by ₹20 for each succeeding metre. Does this situation make an arithmetic progression and why? **[5]**

58. Divya deposited ₹1000 at compound interest at the rate of 10% per annum. Find the amount at the end of first year, second year, third year,..., and so on. Does this situation make an arithmetic progression. If yes, why? **[5]**

59. The sum of the first three numbers in an Arithmetic Progression is 18. If the product of the first and the third term is 5 times the common difference, find the three numbers. **[5]**

Section D

60. **Fill in the blanks:** **[6]**

    (a) Five consecutive terms of an AP are denoted by: a - 2d, a - d, a, a + d, _____. **[1]**

    (b) 1, 4, 9 form a sequence in which next two terms are ____ and ____. **[1]**

    (c) The common difference of the AP 0.9, 0.6, 0.3 is _____. **[1]**

    (d) Three consecutive terms in an AP are denoted by: a - d, a, _____. **[1]**

    (e) Four consecutive terms in an AP are denoted by: a - 3d, a - d, a + d, _____. **[1]**

    (f) _____ progression is a sequence in which the difference between two consecutive no. terms is a **[1]**

constant.

Section E

61. **State True or False:** **[10]**

(a) The taxi fare after each km, when the fare is Rs 15 for the first km and Rs 8 for each additional km, does not form an AP as the total fare (in Rs) after each km is 15, 8, 8, 8, … . **[1]**

(b) The first term and common difference of the AP: 5, 8, 11, 4, ...is 3, 5 respectively. **[1]**

(c) The common difference of the AP: 3, -2, -7, -12, ... is -5. **[1]**

(d) 20^{th} term of A.P. whose first term = 10, common difference = 3 is 67. **[1]**

(e) Progressions with equal common difference are known as Geometric Progression. **[1]**

(f) The common differences of an AP can always be positive. **[1]**

(g) 192, 96, 48, 24 forms an AP where first term is 192 and common difference is 48. **[1]**

(h) 2, 11, 22, 33 forms an AP. **[1]**

(i) The sequence 1, 4, 7, 10 is an AP. **[1]**

(j) The following sequence $4, 4+\sqrt{2}, 4+2\sqrt{2}, 4+3\sqrt{2}, \ldots$ form an AP. **[1]**