

- Q1.** Justify whether it is true to say that $-1, -\frac{3}{2}, -2, \frac{5}{2}, \dots$ forms an AP as $a_2 - a_1 = a_3 - a_2$.
- Q2.** For the AP $-3, -7, -11, \dots$ can we find directly $a_{30} - a_{20}$ without actually finding a_{30} and a_{20} ? Give reason for your answer.
- Q3.** Find a, b and c such that the following numbers are in AP, $a, 7, b, 23$ and c .
- Q4.** Determine the AP whose fifth term is 19 and the difference of the eighth term from the thirteenth term is 20.
- Q5.** Which term of the AP $53, 48, 43, \dots$, is the first negative term?
- Q6.** How many terms of the AP $-15, -13, -11, \dots$ are needed to make the sum -55 ?
- Q7.** Which of the following form of an AP? Justify your answer.
 $\sqrt{3}, \sqrt{12}, \sqrt{27}, \sqrt{48}, \dots$
- Q8.** In which of the following situations, do the lists of numbers involved form an AP? Give reasons for your answers.
The fee charged from a student every month by a school for the whole session, when the monthly fee is Rs. 400.
- Q9.** In which of the following situations, do the lists of numbers involved form an AP? Give reasons for your answers.
The fee charged every month by a school from classes I to XII, when the monthly fee for class I is Rs. 250 and it increase by Rs. 50 for the next higher class.
- Q10.** In which of the following situations, do the lists of numbers involved form an AP? Give reasons for your answers.
The amount of money in the account of Varun at the end of every year, when Rs. 1000 is deposited at simple interest of 10% per annum.
- Q11.** In which of the following situations, do the lists of numbers involved form an AP? Give reasons for your answers.
The number of bacteria in a certain food item after each second, when they double in every second.
- Q12.** Find the sum $1 + (-2) + (-5) + (-8) + \dots + (-236)$.
- Q13.** Write the first three terms of the AP's when a and d are as given below:
 $a = \sqrt{2}, d = \frac{1}{\sqrt{2}}$
- Q14.** Justify whether it is true to say that the following are the n^{th} terms of an AP. $2n - 3$
- Q15.** Justify whether it is true to say that the following are the n^{th} terms of an AP. $3n^2 + 5$
- Q16.** Two AP's have the same common difference. The first term of one AP is 2 and that of the other is 7. The difference between their 10th terms is the same as the difference between their 21st terms, which is the same as the difference between any two corresponding terms? Why?

- Q17.** 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, Is the statement true? Give reasons.
- Q18.** Is 0 a term of the AP 31, 28, 25, ...? Justify your answer.
- Q19.** The 26th, 11th and the last terms of an AP are, 0, 3 and $-\frac{1}{5}$, respectively. Find the common difference and the number of terms.
- Q20.** The sum of the 5th and the 7th terms of an AP is 52 and the 10th term is 46. Find the AP.
- Q21.** Find the 20th term of the AP whose 7th term is 24 less than the 11th term, first term being 12.
- Q22.** If the 9th term of an AP is zero, then prove that its 29th term is twice its 19th term.
- Q23.** Find whether 55 is a term of the AP 7, 10, 13, ... or not. If yes, find which term it is.
- Q24.** The angles of a triangle are in AP. The greatest angle is twice the least. Find all the angles of the triangle.
- Q25.** Split 207 into three parts such that these are in AP and the product of the two smaller parts is 4623.
- Q26.** Determine k , so that $k^2 + 4k + 8$, $2k^2 + 3k + 6$ and $3k^2 + 4k + 4$ three consecutive terms of an AP.
- Q27.** If the n^{th} terms of the two AP's 9, 7, 5, ... and 24, 21, 18, ... are the same, then find the value of n . Also, that term.
- Q28.** If sum of the 3rd and the 8th terms of an AP is 7 and the sum of the 7th and 14th terms is -3 , then find the 10th term.
- Q29.** Find the 12th term from the end of the AP $-2, -4, -6, \dots, -100$.
- Q30.** How many numbers lie between 10 and 300, which divided by 4 leave a remainder 3?
- Q31.** Find the sum of the two middle most terms of an AP $-\frac{4}{3}, 1, -\frac{2}{3}, \dots, 4\frac{1}{3}$.
- Q32.** If sum of first 6 terms of an AP is 36 and that of the first 16 terms is 256, then find the sum of first 10 terms.
- Q33.** Find the sum of first 17 terms of an AP whose 4th and 9th terms are -15 and -30 , respectively.
- Q34.** In an AP, if $S_n = 3n^2 + 5n$ and $a_k = 164$, then find the value of k .
- Q35.** In AP, if $S_n = n(4n + 1)$, then find the AP.
- Q36.** If $a_n = 3 - 4n$, then show that a_1, a_2, a_3, \dots form an AP. Also, find S_{20} .
- Q37.** Which term of the AP $-2, -7, -12, \dots$ will be -77 ? Find the sum of this AP upto the term -77 .
- Q38.** The first term of an AP is -5 and the last term is 45. If the sum of the terms of AP is 120, then find the number of terms and the common difference.
- Q39.** Find the sum of all the 11 terms of an AP whose middle most term is 30.
- Q40.** Find the sum of last ten terms of the AP 8, 10, 12, ..., 126.
- Q41.** Find the sum of first seven numbers which are multiples of 2 as well as of 9.
- Q42.** Kanika was given her pocket money on Jan 1st, 2008. She puts Rs. 1 on day 1, Rs. 2 on day 2, Rs. 3 on day 3 and continued doing so till the end of the month, from this money into her piggy bank she also spent Rs 204 of her pocket money, and found that at the end of the month she still had Rs. 100 with her. How much was her pocket money for the month?

- Q43.** The sum of the first n terms of an AP whose first term is 8 and the common difference is 20 is equal to the sum of first $2n$ terms of another AP whose first term is -30 and the common difference is 8. Find n .
- Q44.** 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 will she save Rs. 2000?
- Q45.** The sum of the first five terms of an AP and the sum of the first seven terms of the same AP is 167. If the sum of the first ten terms of this AP is 235, find the sum of its first twenty terms.
- Q46.** The eighth term of an AP is half its second term and the eleventh term exceeds one-third of its fourth term by 1. Find the 15th term.
- Q47.** An AP consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three terms is 429. Find the AP.
- Q48.** Show that the sum of an AP whose first term is a , the second term b and the last term c , is equal to $\frac{(a+c)(b+c-2a)}{2(b-a)}$.
- Q49.** Solve the equation $-4 + (-1) + 2 + \dots + x = 437$.
- Q50.** Jaspal Singh repays his total loan of Rs. 118000 by paying every month starting with the first installment of Rs. 1000. If he increases the installment by Rs. 100 every month, what amount will be paid by him in the 30th installment? What amount of loan does he still have to pay after the 30th installment?
- Q51.** Justify whether it is true to say that the following are the n^{th} terms of an AP. $1 + n + n^2$
- Q52.** Which of the following form of an AP? Justify your answer.
(i) 1, 1, 2, 2, 3, 3, ... (ii) 11, 22, 33, ...
- Q53.** Which of the following form of an AP? Justify your answer.
(i) 0, 2, 0, 2, ... (ii) 2, 2², 2³, 2⁴, ...
- Q54.** Which of the following form of an AP? Justify your answer.
(i) $-1, -1, -1, -1, \dots$ (ii) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$
- Q55.** Verify that following term is an AP and then write its next three terms.
 $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \dots$
- Q56.** Verify that following term is an AP and then write its next three terms.
 $5, \frac{14}{3}, \frac{13}{3}, 4, \dots$
- Q57.** Write the first three terms of the AP's when a and d are as given below:
(i) $a = \frac{1}{2}, d = \frac{-1}{6}$ (ii) $a = -5, d = -3$
- Q58.** Verify that following term is an AP and then write its next three terms.
 $a, 2a + 1, 3a + 2, 4a + 3, \dots$
- Q59.** Verify that following term is an AP and then write its next three terms.
 $a + b, (a + 1) + b, (a + 1) + (b + 1), \dots$
- Q60.** Verify that following term is an AP and then write its next three terms. $\sqrt{3}, 2\sqrt{3}, 3\sqrt{3}, \dots$
- Q61.** Find the sum
 $\left(4 - \frac{1}{n}\right) + \left(4 - \frac{2}{n}\right) + \left(4 - \frac{3}{n}\right) + \dots$ upto n terms.

Q62. Find the sum of those integers between 1 and 500 which are multiples of 2 as well as of 5.

Q63. Find the sum of those integers from 1 to 500 which are multiples of 2 or 5.

Q64. Find the sum of those integers from 1 to 500 which are multiples of 2 as well as of 5.

Q65. Find the sum

$$\frac{a-b}{a+b} + \frac{3a-2b}{a+b} + \frac{5a-3b}{a+b} + \dots \text{ to 11 terms.}$$

Q66. Match the AP's given in column A with suitable common differences given in column B.

	Column A		Column B
(A ₁)	2, -2, -6, -10, ...	(B ₁)	$\frac{2}{3}$
(A ₂)	$a = -18, n = 10, a_n = 0$	(B ₂)	-5
(A ₃)	$a = 0, a_{10} = 6$	(B ₃)	4
(A ₄)	$a_2 = 13, a_4 = 3$	(B ₄)	-4
		(B ₅)	2
		(B ₆)	$\frac{1}{2}$
		(B ₇)	5

Q67. If S_n denotes the sum of first n terms of an AP, then prove that $S_{12} = 3(S_8 - S_4)$.

Q68. The ratio of the 11th term to the 18th term of an AP is 2 : 3. Find the ratio of the 5th term to the 21st term and also the ratio of the sum of the first five terms to the sum of the first 21 terms.

Q69. Find the sum of the intergers between 100 and 200 that are:

(i) divisible by 9.

(ii) not divisible by 9.

Q70. The students of a school decided to beautify the school on the annual day by fixing colourful flags on the straight passage of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi was given the responsibility of placing the flags. Ruchi kept her books where the flags were stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books? What is the maximum distance she travelled carrying a flag.

- S1.** False, clearly the difference of successive terms is not same, all through, $a_2 - a_1 = a_3 - a_2$ but $a_3 - a_2 \neq a_4 - a_3$, therefore it does not form an AP.
- S2.** True, $a_{30} - a_{20} = (a + 29d) - (a + 19d) = 10d = 10(-4) = -40$.
- S3.** $a = -1$, $b = 15$ and $c = 31$.
- S4.** The required AP is 3, 7, 11, 15,
- S5.** 12th term is the first negative term of the given AP .
- S6.** Either 5 or 11 terms are needed to make the sum - 55.
- S7.** The difference of successive terms is same, therefore given list of numbers form an AP.
- S8.** 400, 400, 400, 400, ...
- S9.** 200, 250, 350, 400, ...
- S10.** 1000, 1100, 1200, 1300, ...
- S11.** Since, the difference between each successive term is not same. So, the list does not form an AP.
- S12.** - 9400
- S13.** $\sqrt{2}$, $\frac{3}{\sqrt{2}}$, $\frac{4}{\sqrt{2}}$
- S14.** Yes.
- S15.** No.
- S16.** Theory
- S17.** No, since all the successive terms of the given list have same common difference. So, the total fare after each km form an AP.
- S18.** 0 is not a term of the given AP.
- S19.** The common difference and no. of terms are $-1/5$ and 27, respectively.
- S20.** The required AP is 1, 6, 11, 16.
- S21.** The required 20 term of an AP is 126.
- S22.** Proved.
- S23.** Yes, 17th term of an AP is 55.
- S24.** The required angles of triangle are 80° , 60° and 40° .
- S25.** The required three parts are 67, 69, 71.

- S26.** $k = 0$.
- S27.** The value of n is 16 and that term *i.e.*, n^{th} terms is -21 .
- S28.** $a_{10} = -1$.
- S29.** The 12^{th} term from the end is -78
- S30.** 73 numbers lie between 10 and 300, which divided by 4 leave a remainder 3.
- S31.** Sum of the two middle most terms $= a_9 + a_{10} = 4/3 + 5/3 = 9/3 = 3$.
- S32.** Sum of first 10 terms is 100.
- S33.** The required sum of first 17 terms of an AP is -510 .
- S34.** $k = 27$.
- S35.** The required AP is 5, 13, 21,
- S36.** Prove and then $S_{20} = -780$.
- S37.** The sum of this AP upto the term -77 is -632 .
- S38.** Number of terms and the common difference of an AP are 6 and 10 respectively.
- S39.** The sum of all the 11 terms of an AP is 330.
- S40.** The sum of last ten terms is 1170.
- S41.** The sum of first seven numbers which are multiple of 2 as well as of 9 is 504.
- S42.** 800 was her pocket money for the month.
- S43.** $n = 11$.
- S44.** In 25 months, she will save Rs. 2,000.
- S45.** Sum of first twenty terms of this AP is 970.
- S46.** $a_{15} = 3$.
- S47.** Required AP is 3, 7, 11, 15,
- S48.** Proved.
- S49.** $x = 50$.
- S50.** 3900 will be paid by him in the 30^{th} installment. 44500 still have to pay after the 30^{th} installment.
- S51.** No.
- S52.** (i) The difference of successive terms is not same, therefore given list of numbers does not form an AP.
(ii) The difference of successive terms is same, therefore given list of numbers form an AP.
- S53.** (i) The difference of successive terms is not same, therefore given list of numbers does not form an AP.
(ii) The difference of successive terms is not same, therefore given list of numbers does not form an AP.

- S54.** (i) The difference of successive terms is same, therefore given list of numbers form an AP.
(ii) The difference of successive terms is not same, therefore given list of numbers does not form an AP.
- S55.** The each successive term of the given list has the same difference. So, it forms an AP, the next three terms are $1, 5/4, 3/2$.
- S56.** The each successive term of the given list has the same difference. So, it forms an AP, the next three terms are $11/3, 10/3, 3$.
- S57.** (i) $1/2, 1/3, 1/6$. (ii) $-5, -8, -11$.
- S58.** The each successive term of the given list has the same difference. So, it forms an AP, the next three terms are $5a + 4, 6a + 5, 7a + 6$.
- S59.** The each successive term of the given list has the same difference. So, it forms an AP, the next three terms are $(a + 2) + (b + 1), (a + 2) + (b + 2), (a + 3) + (b + 2)$.
- S60.** The each successive term of the given list has the same difference. So, it forms an AP, the next three terms are $4\sqrt{3}, 5\sqrt{3}, 6\sqrt{3}$.
- S61.** $\frac{7n - 1}{2}$
- S62.** 12250
- S63.** 75250.
- S64.** 12750
- S65.** $\frac{11}{2} \left(\frac{22a - 12b}{a + b} \right)$
- S66.** $(A_1) \rightarrow B_4, (A_2) \rightarrow B_5, (A_3) \rightarrow B_1,$ and $(A_4) \rightarrow B_2$.
- S67.** Proved.
- S68.** $a_5 : a_{21} = 1 : 3, S_5 : S_{21} = 5 : 49$.
- S69.** (i) 1683 (ii) 13167
- S70.** The required is 728 m, in which she did cover in completing this job and returning back to collect her books.
Maximum distance she travelled carrying a flag is 26 m.