

- Q1.** Write the first five terms of the sequence defined by  $a_n = (-1)^{n-1} \cdot 2^n$ .
- Q2.** What is 18th term of the sequence defined by  $a_n = \frac{n(n-3)}{n+4}$ .
- Q3.** Show that the sequence defined by  $a_n = 4n + 5$  is an A.P. Also, find its common difference.
- Q4.** Show that the sequence defined by  $a_n = 2n^2 + 1$  is not an A.P.
- Q5.** Find the common difference and write the next three terms of the A.P., 3, -2, -7, -12, ...
- Q6.** Find the 12<sup>th</sup>, 24<sup>th</sup> and  $n^{\text{th}}$  term of the A.P., given by 9, 13, 17, 21, 25, ...
- Q7.** Show that the sequence 9, 12, 15, 18, ... is an A.P. Find its 16<sup>th</sup> term and the general term.
- Q8.** Determine the 10<sup>th</sup> term from the end of the A.P., 4, 9, 14, ..., 254.
- Q9.** Which term of the sequence -1, 3, 7, 11, ... is 95?
- Q10.** Which term of the sequence 4, 9, 14, 19, ... is 124?
- Q11.** Is 184 a term of the sequence 3, 7, 11, ...?
- Q12.** If  $2x, x + 10, 3x + 2$  are in A.P., find the value of  $x$ .
- Q13.** If  $x + 1, 3x$  and  $4x + 2$  are in A.P., find the value of  $x$ .
- Q14.** Find the sum of 20<sup>th</sup> terms of the A.P., 1, 4, 7, 10, ...
- Q15.** Find the sum of all even integers between 101 and 999.
- Q16.** For what value of  $p$  are  $2p + 1, 13, 5p - 3$  are three consecutive terms of an A.P.?
- Q17.** The  $n^{\text{th}}$  term of an A.P. is  $6n + 2$ . Find the common difference.
- Q18.** If  $\frac{4}{5}, a, 2$  are three consecutive terms of an A.P., then find the value of  $a$ .
- Q19.** If 17<sup>th</sup> and 13<sup>th</sup> terms of an A.P. be 34 and 64 respectively, then its 18<sup>th</sup> term is  
(a) 87                      (b) 88                      (c) 89                      (d) 90
- Q20.** If the sum of  $p$  terms of an A.P. is  $q$  and the sum of  $q$  terms is  $p$ , then the sum of  $p + q$  terms will be  
(a) 0                      (b)  $p - q$                       (c)  $p + q$                       (d)  $-(p + q)$
- Q21.** If the sum of  $n$  terms of an A.P. be  $3n^2 + n$  and its common difference is 6, then its first term is  
(a) 2                      (b) 3                      (c) 1                      (d) 4
- Q22.** The first and last terms of an A.P. are 1 and 11. If the sum of its terms is 36, then the number of terms will be  
(a) 5                      (b) 6                      (c) 7                      (d) 8
- Q23.** If the sum of  $n$  terms of an A.P. is  $3n^2 + 5n$  then which of its terms is 164?  
(a) 26<sup>th</sup>                      (b) 27<sup>th</sup>                      (c) 28<sup>th</sup>                      (d) None of these

- Q24.** If the sum of  $n$  terms of an A.P. is  $2n^2 + 5n$ , then its  $n^{\text{th}}$  term is  
 (a)  $4n - 3$  (b)  $3n - 4$  (c)  $4n + 3$  (d)  $3n + 4$
- Q25.** In an A.P.,  $S_p = q$ ,  $S_q = p$  and  $S_r$  denotes the sum of first  $r$  terms. Then  $S_{p+q}$  is equal to  
 (a) 0 (b)  $-(p + q)$  (c)  $p + q$  (d)  $pq$
- Q26.** If  $S_n$  denote the sum of the first  $n$  terms of an A.P. If  $S_{2n} = 3S_n$ , then  $S_{3n} : S_n$  is equal to  
 (a) 4 (b) 6 (c) 8 (d) 10
- Q27.** If the sum of first  $n$  even natural numbers is equal to  $k$  times the sum of first  $n$  odd natural numbers, then  $k =$   
 (a)  $\frac{1}{n}$  (b)  $\frac{n-1}{n}$  (c)  $\frac{n+1}{2n}$  (d)  $\frac{n+1}{n}$
- Q28.** Let  $S_n$  denote the sum of  $n$  terms of an A.P., whose first term is  $a$ . If the common difference  $d$  is given by  $d = S_n - kS_{n-1} + S_{n-2}$ , then  $k =$   
 (a) 1 (b) 2 (c) 3 (d) None of these
- Q29.** If four numbers in A.P. are such that their sum is 50 and the greatest number is 4 times the least, then the numbers are:  
 (a) 5, 10, 15, 20 (b) 4, 10, 16, 22 (c) 3, 7, 11, 15 (d) None of these
- Q30.** If the sum of three consecutive terms of an increasing A.P. is 51 and the product of the first and third of these terms is 273, then the third term is  
 (a) 13 (b) 9 (c) 21 (d) 17
- Q31.** The number of terms of the A.P., 3, 7, 11, 15, ... to be taken so that the sum is 406 is  
 (a) 5 (b) 10 (c) 12 (d) 14
- Q32.** The sum of first 20 odd natural numbers is  
 (a) 100 (b) 210 (c) 400 (d) 420
- Q33.** The first three terms of an AP respectively are  $3y - 1$ ,  $3y + 5$  and  $5y + 1$ . Then  $y$  equals  
 (a) -3 (b) 4 (c) 5 (d) 2
- Q34.** The next term of the A.P.,  $\sqrt{7}$ ,  $\sqrt{28}$ ,  $\sqrt{64}$ , ...  
 (a)  $\sqrt{70}$  (b)  $\sqrt{84}$  (c)  $\sqrt{97}$  (d)  $\sqrt{112}$
- Q35.** 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) 6
- Q36.** The common difference of the A.P. is  $\frac{1}{2b}$ ,  $\frac{1-6b}{2b}$ ,  $\frac{1-12b}{2b}$ , ... is  
 (a)  $2b$  (b)  $-2b$  (c) 3 (d) -3
- Q37.** The common difference of the A.P. is  $\frac{1}{3}$ ,  $\frac{1-3b}{3}$ ,  $\frac{1-6b}{3}$ , ... is  
 (a)  $\frac{1}{3}$  (b)  $-\frac{1}{3}$  (c)  $-b$  (d)  $b$
- Q38.** The common difference of the A.P. is  $\frac{1}{2q}$ ,  $\frac{1-2q}{2q}$ ,  $\frac{1-4q}{2q}$ , ... is  
 (a) -1 (b) 1 (c)  $q$  (d)  $2q$
- Q39.** If the first term of an A.P. is 2 and common difference is 4, then the sum of its 40 terms is  
 (a) 3200 (b) 1600 (c) 200 (d) 2800

- Q40.** The sum of  $n$  terms of two A.P.'s are in the ratio  $5n + 9 : 9n + 6$ . Then, the ratio of their 18<sup>th</sup> term is
- (a)  $\frac{179}{321}$                       (b)  $\frac{178}{321}$                       (c)  $\frac{175}{321}$                       (d)  $\frac{176}{321}$
- Q41.** Sum of  $n$  terms of the series  $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \dots$  is
- (a)  $\frac{n(n+1)}{2}$                       (b)  $2n(n+1)$                       (c)  $\frac{n(n+1)}{\sqrt{2}}$                       (d) 1
- Q42.** If  $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$  are in A.P. Then,  $x =$
- (a) 5                      (b) 3                      (c) 1                      (d) 2
- Q43.** The sum of first  $n$  odd natural numbers is
- (a)  $2n - 1$                       (b)  $2n + 1$                       (c)  $n^2$                       (d)  $n^2 - 1$
- Q44.** Two A.P.'s have the same common difference. The first term of one of these is 8 and that of the other is 3. The difference between their 30<sup>th</sup> terms is
- (a) 11                      (b) 3                      (c) 8                      (d) 5
- Q45.** If 18,  $a$ ,  $b$ ,  $-3$  are in A.P., the  $a + b =$
- (a) 19                      (b) 7                      (c) 11                      (d) 15
- Q46.** A sequence is defined by  $a_n = n^3 - 6n^2 + 11n - 6$ . Show that the first three terms of the sequence are zero and all other terms are positive.
- Q47.** Let a sequence be defined by  $a_1 = 1, a_2 = 1$ .
- Q48.** The general term of a sequence is given by  $a_n = -4n + 15$ . Is the sequence an A.P. If so, find its 15<sup>th</sup> term and the common difference.
- Q49.** Prove that no matter what the real numbers  $a$  and  $b$  are, the sequence with  $n^{\text{th}}$  term  $a + ab$  is always an A.P. What is the common difference?
- Q50.** Find the middle term(s) of the A.P. 7, 13, 19, ..., 241.
- Q51.** Which term of the sequence  $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}$  is the first negative term?
- Q52.** Determine the general term of an A.P., whose 7<sup>th</sup> term is  $-1$  and 16<sup>th</sup> term 17.
- Q53.** How many numbers of two digits are divisible by 7?
- Q54.** Find the number of integers between 50 and 500 which are divisible by 7.
- Q55.** The first term of an A.P. is 5, the common difference is 3 and the last term is 80; find the number of terms.
- Q56.** The 6<sup>th</sup> and 17<sup>th</sup> terms of an A.P. are 19 and 41 respectively, find the 40<sup>th</sup> term.
- Q57.** The 10<sup>th</sup> and 18<sup>th</sup> term of an A.P. are 41 and 73 respectively. Find 26<sup>th</sup> term.
- Q58.** In a certain A.P. the 24<sup>th</sup> term is twice the 10<sup>th</sup> term. Prove that the 72<sup>nd</sup> term is twice the 34<sup>th</sup>.
- Q59.** If the  $n^{\text{th}}$  term of the A.P. 9, 7, 5, ... is same as the  $n^{\text{th}}$  term of the A.P., 15, 12, 9, ... find  $n$ .
- Q60.** Find the value of  $x$  for which  $(8x + 4), (6x - 2)$  and  $(2x + 7)$  are in A.P.
- Q61.** The sum of three numbers in A.P. is  $-3$ , and their product is 8. Find the numbers.



- Q90.** How many terms of the A.P., 63, 60, 57, ... must be taken so that their sum is 693?
- Q91.** If the  $n^{\text{th}}$  term of an A.P. is  $(2n + 1)$ , find the sum of first  $n$  terms of the A.P.
- Q92.** Find the sum of the first 25 terms of an A.P., whose  $n^{\text{th}}$  term is given by  $a_n = 7 - 2n$ .
- Q93.** The sum of first  $n$  terms of an A.P. is  $3n^2 + 6n$ . Find the  $n^{\text{th}}$  term of this A.P.
- Q94.** The sum of first  $n$  terms of an A.P. is  $3n^2 + 4n$ . Find the 25<sup>th</sup> term of this A.P.
- Q95.** The  $n^{\text{th}}$  term of an A.P. is given by  $(-4n + 15)$ . Find the sum of first 20<sup>th</sup> terms of this AP.
- Q96.** Sum of the first 14 terms of an A.P. is 1505 and its first term is 10. Find its 25<sup>th</sup> terms.
- Q97.** In an A.P., the first term is 2, the last term is 29 and the sum of the terms is 155. Find the common difference of the A.P.
- Q98.** If the sum of first  $p$  term of an A.P. is  $ap^2 + bp$ , find its common difference.
- Q99.** The first term of an A.P. is  $p$  and its common difference is  $q$ . Find its 10<sup>th</sup> term.
- Q100** If the 10<sup>th</sup> term of an A.P. is 21 and the sum of its first ten terms is 120, find its  $n^{\text{th}}$  term.
- Q101** The sum of first  $n$  terms of an A.P. is  $4n^2 + 2n$ . Find the  $n^{\text{th}}$  term of this AP.
- Q102** The sum of first  $n$  terms of an A.P. is  $5n - n^2$ . Find the  $n^{\text{th}}$  term of this AP.
- Q103** Consider the A.P. 2, 5, 8, 11, ..., 302. Show that twice of the middle term of the above A.P. is equal to the sum of its first and last term.
- Q104** In the A.P., 1, 7, 13, 19, ..., 415, Prove that the sum of the middle terms is equal to the sum of first and last terms.
- Q105** If five times the fifth term of an A.P. is equal to 8 times its eighth term, show that its 13<sup>th</sup> term is zero.
- Q106** The 10<sup>th</sup> term of an A.P. is 52 and 16<sup>th</sup> term is 82. Find the 32<sup>nd</sup> term and the general term.
- Q107** If 10 times the 10<sup>th</sup> term of an A.P. is equal to 15 times the 15<sup>th</sup> term, show that 25<sup>th</sup> term of the A.P. is zero.
- Q108** If  $(m + 1)^{\text{th}}$  term of an A.P. is twice the  $(n + 1)^{\text{th}}$  term, prove that  $(3m + 1)^{\text{th}}$  term is twice the  $(m + n + 1)^{\text{th}}$  term.
- Q109** Divide 32 into four parts which are in A.P. such that the product of extremes is to the product of means is 7 : 15.
- Q110** Find four numbers in AP whose sum is 20 and the sum of those squares is 120.
- Q111** If the 5<sup>th</sup> term of an A.P. is 31 and 25<sup>th</sup> term is 140 more than the 5<sup>th</sup> term, find the A.P.
- Q112** An A.P. consists of 60 terms. If the first and the last terms be 7 and 125 respectively, find 32<sup>nd</sup> term.
- Q113** If an A.P. consists of  $n$  terms with first term  $a$  and  $n^{\text{th}}$  term  $l$  show that the the sum of the  $m^{\text{th}}$  term from the beginning and the  $m^{\text{th}}$  term from the end is  $(a + l)$ .
- Q114** If the numbers  $a, b, c, d, e$  form an A.P., then find the value of  $a - 4b + 6c - 4d + e$ .
- Q115** Find the four numbers in A.P., whose sum is 50 and in which the greatest number is 4 times the least.
- Q116** Three numbers are in A.P. If the sum of these numbers be 27 and the product 648, find the numbers.
- Q117** The sum of three terms of an A.P. is 21 and the product of the first and the third terms exceeds the second term by 6, find three terms.

- Q118** Find the sum of first 20 terms of an A.P., in which 3<sup>rd</sup> term is 7 and 7<sup>th</sup> term is two more than thrice of its 3<sup>rd</sup> term.
- Q119** The angles of a quadrilateral are in A.P. whose common difference is 10°, Find the angles.
- Q120** Find the sum of all natural numbers between 250 and 1000 which are exactly divisible by 3.
- Q121** Find the number of terms in the series  $20 + 19\frac{1}{9} + 18\frac{2}{3} + \dots$  of which the sum is 300, explain the double answer.
- Q122** The third term of an A.P. is 7 and the seventh term exceeds three times the third terms by 2. Find the first term, the common difference and the sum of first 20 terms.
- Q123** If 12<sup>th</sup> term of an A.P. is -13 and the sum of the first four terms is 24, what is the sum of first 10 terms?
- Q124** Find the sum of all integers between 100 and 550, which are divisible by 9.
- Q125** A man is employed to count Rs. 10710. He counts at the rate of Rs. 180 per minute for half an hour. After this he counts at the rate of Rs. 3 less every minute than the preceding minute. Find the time taken by him to count the entire amount.
- Q126** In an A.P., if the 5<sup>th</sup> and 12<sup>th</sup> terms are 30 and 65 respectively, what is the sum of first 20 terms?
- Q127** In an A.P., if the first term is 22, the common difference is -4 and the sum to  $n$  terms is 64, find  $n$ .
- Q128** The sum of 5<sup>th</sup> and 9<sup>th</sup> terms of an A.P. is 72 and the sum of 7<sup>th</sup> and 12<sup>th</sup> terms is 97. Find the A.P.
- Q129** The 17<sup>th</sup> term of an A.P. is 5 more than twice its 8<sup>th</sup> term. If the 11<sup>th</sup> term of the A.P. is 43, find the  $n^{\text{th}}$  term.
- Q130** The sum of first six terms of an arithmetic progression is 42. The ratio of its 10<sup>th</sup> term to its 30<sup>th</sup> term is 1 : 3. Calculate the first and the thirteenth term of the A.P.
- Q131** Find the middle term of the A.P., 213, 205, 197, ..., 37.
- Q132** The sum of 5<sup>th</sup> and 9<sup>th</sup> terms of an A.P. is 30. If its 25<sup>th</sup> term is three times its 8<sup>th</sup> term, find the AP.
- Q133** If the seventh term of an A.P. is  $\frac{1}{9}$  and its ninth term is  $\frac{1}{7}$ , find its (63)<sup>rd</sup> term.
- Q134** Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.
- Q135** The 24<sup>th</sup> term of an A.P. is twice its 10<sup>th</sup> term. Show that its 72<sup>nd</sup> term is 4 times its 15<sup>th</sup> term.
- Q136** The 9<sup>th</sup> term of an A.P. is equal to 6 times its second term. If its 5<sup>th</sup> term is 22, find the A.P.
- Q137** The 19<sup>th</sup> term of an A.P. is equal to three times its sixth term. If its 9<sup>th</sup> term is 19, find the A.P.
- Q138** The sum of the first  $n$  terms of an A.P. is  $5n^2 + 3n$ . If its  $m^{\text{th}}$  term is 168, find the value of  $m$ . Also, find the 20<sup>th</sup> term of this A.P.
- Q139** In an A.P., the sum of first ten terms is -150 and the sum of its next ten terms is -550. Find the AP.
- Q140** In an A.P., the first term is 22,  $n^{\text{th}}$  term is -11 and the sum to first  $n$  terms is 166. Find  $n$  and  $d$ , the common differences.
- Q141** In an A.P., the first term is 8,  $n^{\text{th}}$  term is 33 and the sum to first  $n$  terms is 123. Find  $n$  and  $d$ , the common differences.
- Q142** In an A.P., the sum of first  $n$  terms is  $\frac{3n^2}{2} + \frac{5n}{2}$ . Find its 25<sup>th</sup> term.
- Q143** If  $S_n$ , the sum of first  $n$  terms of an A.P., is given by  $S_n = 5n^2 + 3n$ , then find its  $n^{\text{th}}$  term.

**Q144** How many terms of the series 54, 51, 48, ... be taken so that their sum is 513? Explain the double answer.

**Q145** Find the sum of all three digit natural numbers, which are divisible by 7.

**Q146** The sum of the first  $m$  terms of an A.P. is  $4m^2 - m$ . If its  $m^{\text{th}}$  term is 107, find the value of  $n$ . Also, find the  $21^{\text{st}}$  term of this A.P.

**Q147** Find the number of terms of the A.P., -12, -9, -6, ... 21. If 1 added to each term of this A.P., then find the sum of all terms of the A.P., thus obtained.

**Q148** The sum of the first  $q$  terms of an A.P. is  $63q - 3q^2$ . If its  $p^{\text{th}}$  term is -60, find the value of  $p$ . Also, find the  $11^{\text{th}}$  term of this A.P.

**Q149** 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 students.

**Q150** If  $S_n$  denotes the sum of the first  $n$  terms of an A.P., prove that  $S_{30} = 3(S_{20} - S_{10})$ .

**Q151** The sum of the first 7 terms of an A.P. is 63 and the sum of its next 7 terms is 161. Find the  $28^{\text{th}}$  term of this A.P.

**Q152** The sum of first seven terms of an A.P. is 182. If its  $4^{\text{th}}$  and the  $17^{\text{th}}$  terms are in the ratio 1 : 5, find the AP.

**Q153** Ramkali would need Rs. 1800 for admission fee and books etc., for her daughter to start going to school from next year. She saved Rs. 50 in the first month of this year and increased her monthly saving by Rs. 20. After a year, how much money will she save? Will she be able to fulfil her dream of sending her daughter to school?

**Q154** If  $S_n$  denotes the sum of first  $n$  terms of an A.P., prove that  $S_{12} = 3(S_8 - S_4)$ .

**Q155** The first and the last terms of an A.P. are 5 and 45 respectively. If the sum of all its terms is 400, find its common difference.

**Q156** The sum of first  $q$  terms of an A.P. is 162. The ratio of its  $6^{\text{th}}$  term to its  $13^{\text{th}}$  term is 1 : 2. Find the first and  $15^{\text{th}}$  term of the A.P.

**Q157** If the sum of first  $n$  terms of an A.P. is  $\frac{1}{2}(3n^2 + 7n)$ , then find its  $n^{\text{th}}$  term. Hence write its  $20^{\text{th}}$  term.

**Q158** The first and the last terms of an A.P. are 7 and 49 respectively. If sum of all its terms is 420, find its common difference.

**Q159** If  $p^{\text{th}}$ ,  $q^{\text{th}}$  and  $r^{\text{th}}$  terms of an A.P. are  $a$ ,  $b$ ,  $c$  respectively, then show that

$$a(q - r) + r(r - p) + c(p - q) = 0.$$

**Q160** If the  $m^{\text{th}}$  term of an A.P. be  $1/n$  and  $n^{\text{th}}$  term be  $1/m$ , then show that its  $(mn)^{\text{th}}$  term is 1.

**Q161** The digits of a positive integer, having three digits are in A.P. and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

**Q162** If  $p^{\text{th}}$ ,  $q^{\text{th}}$  and  $r^{\text{th}}$  terms of an A.P. are  $a$ ,  $b$ ,  $c$  respectively, then show that

$$(a - b)r + (b - c)p + (c - a)q = 0.$$

**Q163** If  $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$  is the A.M. between  $a$  and  $b$ . Then, find the value of  $n$ .

**Q164** If the sum of  $m$  terms of an A.P. is the same as the sum of its  $n$  terms, show that the sum of its  $(m + n)$  terms is zero.

**Q165** If in an A.P. the sum of  $m$  terms is equal to  $n$  and the sum of  $n$  terms is equal to  $m$ , then prove that the sum of  $(m + n)$  terms is  $-(m + n)$ .

- Q166** The sums of  $n$  terms of three arithmetical progressions are  $S_1, S_2$  and  $S_3$ . The first term of each is unity and the common difference are 1, 2 and 3 respectively. Prove that  $S_1 + S_3 = 2S_2$ .
- Q167** The sum of  $n, 2n, 3n$  terms of an A.P. are  $S_1, S_2, S_3$  respectively. Prove that  $S_3 = 3(S_2 - S_1)$ .
- Q168** The sum of the third and seventh terms of an A.P. is 6 and their product is 8. Find the sum of first sixteen terms of the A.P.
- Q169** The ratio of the sum of  $n$  terms of two A.P.'s is  $(7n + 1) : (4n + 27)$ . Find the ratio of their  $m^{\text{th}}$  terms.
- Q170** The sum of the first  $p, q, r$  terms of an A.P. are  $a, b, c$  respectively. Show that
- $$\frac{a}{p}(q-r) + \frac{b}{q}(r-p) + \frac{c}{r}(p-q) = 0$$
- Q171** The ratio of the sums of  $m$  and  $n$  terms of an A.P. is  $m^2 : n^2$ . Show that the ratio of the  $m^{\text{th}}$  and  $n^{\text{th}}$  terms is  $(2m - 1) : (2n - 1)$ .
- Q172** Raghav buys a shop for Rs. 1,20,000. He pays half of the amount in cash and agrees to pay the balance in 12 annual instalments of Rs. 5000 each. If the rate of interest is 12% and he pays with the instalment the interest due on the unpaid amount, find the total cost of the shop.
- Q173** If there are  $(2n + 1)$  terms in A.P., then prove that the ratio of the sum of odd terms and the sum of even terms is  $(n + 1) : n$ .
- Q174** Along a road lie an odd number of stones placed at intervals of 10 metres. These stones have to be assembled around the middle stone. A person can carry only one stone at a time. A man carried the job with one of the end stones by carrying them in succession. In carrying all the stones he covered a distance of 3 km. Find the number of stones.
- Q175** 150 workers were engaged to finish a piece of work in a certain number of days. Four workers dropped the second day, four more workers dropped the third day and so on. It takes 8 more days to finish the work now. Find the number of days in which the work was completed.
- Q176** A man repays a loan of Rs. 3250 by paying Rs. 20 in the first month and then increases the payment by Rs. 15 every month. How long will it take him to clear the loan?
- Q177** Two cars start together in the same direction from the same place. The first goes with uniform speed of 10 km/h. The second goes at a speed of 8 km/h in the first hour and increases the speed by  $1/2$  km in each succeeding hour. After how many hours will the second car overtake the first car if both cars go non-stop?
- Q178** If the  $m^{\text{th}}$  term of an A.P. is  $\frac{1}{n}$  and the  $n^{\text{th}}$  term is  $\frac{1}{m}$ , show that the sum of  $mn$  terms is  $\frac{1}{2}(mn + 1)$ .
- Q179** If  $m$  times the  $m^{\text{th}}$  term of an A.P. is equal to  $n$  times its  $n^{\text{th}}$  term, show that the  $(m + n)^{\text{th}}$  term of the A.P. is zero.
- Q180** If the  $p^{\text{th}}$  term of an A.P. is  $q$  and the  $q^{\text{th}}$  term is  $p$ , prove that its  $n^{\text{th}}$  term is  $(p + q - n)$ .



- S1.** 2, -4, 8, -16, 32.
- S2.**  $a_{18} = \frac{135}{11}$ .
- S3.** Given sequence is an A.P. with common difference 4.
- S4.** Proved.
- S5.** -17, -22, -27.
- S6.**  $a_{12} = 53, a_{24} = 101$  and  $a_n = 4n + 5$ .
- S7.**  $a_{16} = 54$  and  $a_n = 3n + 6$ .
- S8.** 10<sup>th</sup> term from the end of the A.P. is 209.
- S9.** 25<sup>th</sup> term of the given sequence is 95.
- S10.** 25<sup>th</sup> term of the given sequence is 124.
- S11.** No, 184 is not a term of the given sequence.
- S12.** The value of  $x = 6$ .
- S13.** The value of  $x = 3$ .
- S14.**  $S_{20} = 590$ .
- S15.** 246950.
- S16.** 4.
- S17.** 6
- S18.**  $\frac{7}{5}$ .
- S19.** (c) 89.
- S20.** (d)  $-(p + q)$ .
- S21.** (a) 2.
- S22.** (b) 6.
- S23.** (b) 27<sup>th</sup>.
- S24.** (c)  $4n + 3$ .
- S25.** (b)  $-(p + q)$ .

**S26.** (b) 6.

**S27.** (d)  $\frac{n+1}{n}$ .

**S28.** (b) 2.

**S29.** (a) 5, 10, 15, 20.

**S30.** (c) 21.

**S31.** (d) 14.

**S32.** (c) 400.

**S33.** (c) 5.

**S34.** (d)  $\sqrt{112}$ .

**S35.** (b) 3.

**S36.** (d) -3.

**S37.** (c) -b.

**S38.** (a) -1.

**S39.** (a) 3200.

**S40.** (a)  $\frac{179}{321}$ .

**S41.** (c)  $\frac{n(n+1)}{\sqrt{2}}$ .

**S42.** (c) 1.

**S43.** (c)  $n^2$ .

**S44.** (d) 5.

**S45.** (d) 15.

**S46.** Proved.

**S47.**  $\frac{a_5}{a_4} = \frac{5}{3}$ .

**S48.** -45, -4.

**S49.** Proved.

**S50.** 121, 127.

**S51.** 28<sup>th</sup> term of the given sequence is the first negative term.

**S52.** The general term of an A.P. is  $a_n = 2n - 15$ .

- S53.** There are 13 numbers of two digits which are divisible by 7.
- S54.** There are 64 integers between 50 and 500 which are divisible by 7.
- S55.** 26.
- S56.** 87.
- S57.** 105.
- S58.** Proved.
- S59.** 7.
- S60.** The value of  $x = 15/2$ .
- S61.** The numbers are,  $-4, -1, -2$  or  $2, -1, -4$ .
- S62.** First term = 3, Common difference = 2.
- S63.** The sum of first 30<sup>th</sup> terms is 1680.
- S64.**  $S_n = \frac{n(n+1)}{2}$ .
- S65.** Required sum  $S_n = 867$ .
- S66.**  $n(n - 3n)$ .
- S67.** No of terms = 38, and total sum is 6973.
- S68.** 50800.
- S69.** In first year he saved Rs. 1200.
- S70.**  $n(n + 1)$ .
- S71.**  $n^2$ .
- S72.** 17696.
- S73.** Middle term of the given A.P. is 111.
- S74.** There is no value of  $n$ .
- S75.** The A.P. is 7, 12, 17, 22, ...
- S76.** 44<sup>th</sup> term of the given A.P.
- S77.** The A.P. is 3, 7, 11, 15, 19, ...
- S78.** 2, 7, 12, 17, ....
- S79.** 25<sup>th</sup>.
- S80.** 13.
- S81.** 53<sup>rd</sup>.

**S82.** 49<sup>th</sup>.

**S83.** 100.

**S84.** 31<sup>st</sup>.

**S85.** -13, -8, -3, 2, 7, ...

**S86.** 108

**S87.** 163.

**S88.** -925.

**S89.** -441.

**S90.** 21, 22.

**S91.**  $S_n = n(n + 2)$ .

**S92.** -800.

**S93.**  $6n + 3$ .

**S94.** 151.

**S95.** 760.

**S96.** 370.

**S97.** 3.

**S98.**  $2a$ .

**S99.**  $p + 9q$ .

**S100.**  $2n + 1$ .

**S101.**  $4n - 2$ .

**S102.**  $6 - 2n$ .

**S103.** 304.

**S104.** Proved.

**S105.** Proved.

**S106.**  $a_{32} = 162$  and  $a_n = 5n + 2$ .

**S107.** Proved.

**S108.** Proved.

**S109.** Four parts are 2, 6, 10, 14.

**S110.** 2, 4, 6, 8 or 8, 6, 4, 2.

**S111.** 3, 10, 17, 24, ...

**S112.** The 32<sup>nd</sup> term is 69.

**S113.** Proved.

**S114.** The value of  $a - 4b + 6c - 4d + e = 0$ .

**S115.** 5, 10, 15, 20.

**S116.** 6, 9, 12.

**S117.** 1, 7, 13.

**S118.**  $S_{20} = 740$ .

**S119.**  $75^\circ, 85^\circ, 95^\circ, 105^\circ$ .

**S120.** 156375.

**S121.**  $n = 25$  or  $36$ .

**S122.** -1, 4, 740.

**S123.** 0.

**S124.** 16425.

**S125.** 89 minutes.

**S126.** 1150.

**S127.** 4 or 8.

**S128.** The A.P. is 6, 11, 16, 21, 26, ...

**S129.**  $4n - 1$ .

**S130.** First term = 2, and thirteenth term = 26.

**S131.** 125.

**S132.** 3, 5, 7, 9, 11, ...

**S133.** 1.

**S134.** 89.

**S135.** 2, 7, 12, 17, ...

**S136.** 2, 7, 12, 17, ...

**S137.** 3, 5, 7, 9, ...

**S138.**  $m = 17, a_{20} = 198$ .

**S139.**  $a = 3, d = -4$ .

**S140.**  $n = 12, d = -3.$

**S141.**  $n = 6, d = 5.$

**S142.**  $a_{25} = 76.$

**S143.**  $a_n = 10n - 2.$

**S144.**  $n = 18$  or  $19.$

**S145.**  $70336.$

**S146.**  $n = 14, a_{21} = 163.$

**S147.**  $12, 66.$

**S148.**  $p = 21, a_{11} = 0.$

**S149.**  $312.$

**S150.**  $6 - 2n.$

**S151.**  $57.$

**S152.**  $2, 10, 18, 26, \dots$

**S153.**  $1920, \text{Yes.}$

**S154.**  $\text{Proved.}$

**S155.**  $d = \frac{8}{3}.$

**S156.**  $6, 48.$

**S157.**  $a_n = 3n + 2, a_{20} = 62.$

**S158.**  $3.$

**S159.**  $\text{Proved.}$

**S160.**  $\text{Proved.}$

**S161.**  $\text{The number is } 852.$

**S162.**  $\text{Proved.}$

**S163.**  $\text{The value of } n = 0.$

**S164.**  $\text{Proved.}$

**S165.**  $\text{Proved.}$

**S166.**  $\text{Proved.}$

**S167.**  $\text{Proved.}$

**S168.**  $S_{16} = 76$  or  $20.$

**S169.**  $\frac{14m - 6}{8m + 23}$ .

**S170.** Proved.

**S171.** Proved.

**S172.** Rs. 1,66,860.

**S173.** Proved.

**S174.** The number of stones 25.

**S175.** The work is completed in 25 days.

**S176.** The loan is cleared in 20 months.

**S177.** The second car will overtake the first car in 9 hours.

**S178.** Proved.

**S179.** Proved.

**S180.** Proved.

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