

WANDOOR GANITHAM – S.S.L.C STUDY MATERIAL 2022

FOCUS AREA - ARITHMETIC SEQUENCES – PART 2 -ANSWERS

1 Find the sums of the following arithmetic sequences .

a) $1 + 2 + 3 + \dots + 20$

b) $1 + 2 + 3 + \dots + 40$

c) $21 + 22 + 23 + \dots + 40$

d) $23 + 24 + 25 + \dots + 42$

e) $44 + 46 + 48 + \dots + 82$

Answer .

a) $1 + 2 + 3 + \dots + 20 = \frac{20 \times 21}{2} = 210$

b) $1 + 2 + 3 + \dots + 40 = \frac{40 \times 41}{2} = 820$

c) $21 + 22 + 23 + \dots + 40 = 820 - 210 = 610$

d) $23 + 24 + 25 + \dots + 42 = 610 + (20 \times 2) = 610 + 40 = 650$

e) $44 + 46 + 48 + \dots + 82 = 610 + 650 = 1260$

2 a) What is the sum of 10 consecutive natural numbers starting with 1 ?

b) What is the sum of the first 10 terms of the arithmetic sequence 3, 6, 9, ... ?

c) What is the sum of the first 10 terms of the arithmetic sequence 4, 7, 10, ... ?

Answer .

a) $\frac{10 \times 11}{2} = 55$

b) $3 \times 55 = 165$

c) $165 + (10 \times 1) = 165 + 10 = 175$

3	<p>a) What is the sum of 20 consecutive natural numbers starting with 1 ?</p> <p>b) What is the sum of the first 20 terms of the arithmetic sequence 5 , 10 , 15 , . . . ?</p> <p>c) What is the sum of the first 20 terms of the arithmetic sequence 3 , 8 , 13 , . . . ?</p> <p><u>Answer .</u></p> <p>a) $\frac{20 \times 21}{2} = 210$</p> <p>b) $5 \times 210 = 1050$</p> <p>c) $1050 - (20 \times 2) = 1050 - 40 = 1010$</p>
4	<p>Consider the arithmetic sequence 5 , 9 , 13 , . . .</p> <p>a) What is its common difference ?</p> <p>b) What is its 7th term ?</p> <p>c) What is the sum of the first 13 terms of this sequence ?</p> <p><u>Answer .</u></p> <p>a) $d = 9 - 5 = 4$</p> <p>b) $x_7 = f + 6d = 5 + (6 \times 4) = 5 + 24 = 29$</p> <p>c) Sum of the first 13 terms = $13 \times \text{Middle term} = 13 \times x_7 = 13 \times 29 = 377$</p>
5	<p>Consider the arithmetic sequence 8 , 15 , 22 , . . .</p> <p>a) What is its common difference ?</p> <p>b) What is its 6th term ? ?</p> <p>c) What is the sum of the first 11 terms of this sequence ?</p> <p><u>Answer .</u></p> <p>a) $d = 15 - 8 = 7$</p> <p>b) $x_6 = f + 5d = 8 + (5 \times 7) = 8 + 35 = 43$</p> <p>c) Sum of the first 11 terms = $11 \times \text{Middle term} = 11 \times x_6 = 11 \times 43 = 473$</p>
6	<p>First term of an arithmetic sequence is 7 and its common difference is 5 .</p> <p>a) What is its 4th term ?</p> <p>c) What is its 8th term ?</p>

c) What is the sum of the first 7 terms of this sequence ?

d) What is the sum of the first 8 terms of this sequence ?

Answer .

a) $x_4 = f + 3d = 7 + (3 \times 5) = 7 + 15 = 22$

b) $x_8 = x_4 + 4d = 22 + (4 \times 5) = 22 + 20 = 42$

c) Sum of the first 7 terms = $7 \times \text{Middle term} = 7 \times x_4 = 7 \times 22 = 154$

d) Sum of the first 8 terms = Sum of the first 7 terms + x_8
 $= 154 + 42 = 196$

7 First term of an arithmetic sequence is 9 and its common difference is 4 .

a) What is its 7th term ?

b) What is its 14th term ?

c) What is the sum of the first 13 terms of this sequence ?

d) What is the sum of the first 14 terms of this sequence ?

Answer .

a) $x_7 = f + 6d = 9 + (6 \times 4) = 9 + 24 = 33$

b) $x_{14} = x_7 + 7d = 33 + (7 \times 4) = 33 + 28 = 61$

c) Sum of the first 12 terms = $13 \times \text{Middle term} = 13 \times x_7 = 13 \times 33 = 429$

d) Sum of the first 14 terms = Sum of the first 13 terms + x_{14}
 $= 429 + 61 = 490$

8 First term of an arithmetic sequence is 5 and its common difference is 4 .

a) What is its 10th term ?

b) What is its 20th term ?

c) What is the sum of the first 19 terms of this sequence ?

d) What is the sum of the first 20 terms of this sequence ?

Answer .

a) $x_{10} = f + 9d = 5 + (9 \times 4) = 5 + 36 = 41$

b) $x_{20} = x_{10} + 10d = 41 + (10 \times 4) = 41 + 40 = 81$

b) Sum of the first 19 terms = $19 \times \text{Middle term} = 19 \times x_{10} = 19 \times 41 = 779$

c) Sum of the first 20 terms = Sum of the first 11 terms + x_{20}
 $= 779 + 81 = 860$

9 Common difference of an arithmetic sequence is 3 and its 10th term 32 .

a) What is its 11th term ?

b) What is the sum of the first 21 terms of this sequence ?

Answer .

a) $x_{11} = x_{10} + d = 32 + 3 = 35$

b) Sum of the first 21 terms = $21 \times \text{Middle term} = 21 \times x_{11} = 21 \times 32 = 672$

10 Common difference of an arithmetic sequence is 5 and its 7th term 36 .

a) What is its 8th term ?

b) What is the sum of the first 15 terms of this sequence ?

Answer .

a) $x_8 = x_7 + d = 36 + 5 = 41$

b) Sum of the first 15 terms = $15 \times \text{Middle term} = 15 \times x_8 = 15 \times 41 = 615$

11 Common difference of an arithmetic sequence is 4 and its 11th term 42 .

a) What is its 10th term ?

b) What is the sum of the first 19 terms of this sequence ?

Answer .

a) $x_{10} = x_{11} - d = 42 - 4 = 38$

b) Sum of the first 19 terms = $19 \times \text{Middle term} = 19 \times x_{10} = 19 \times 38 = 722$

12 Common difference of an arithmetic sequence is 2 and its 15th term 31 .

a) What is its 14th term ?

b) What is the sum of the first 27 terms of this sequence ?

Answer .

a) $x_{14} = x_{15} - d = 31 - 2 = 29$

b) Sum of the first 27 terms = $27 \times \text{Middle term} = 27 \times x_{14} = 27 \times 29 = 783$

13 The algebraic form of an arithmetic sequence is $4n + 3$.

a) What is its 5th term ?

b) What is the sum of the first 9 terms of this sequence ?

Answer .

a) $x_5 = (4 \times 5) + 3 = 20 + 3 = 23$

b) Sum of the first 9 terms = $9 \times \text{Middle term} = 9 \times x_5 = 9 \times 23 = 207$

14 The algebraic form of an arithmetic sequence is $3n + 2$.

a) What is its 11th term ?

b) What is the sum of the first 21 terms of this sequence ?

Answer .

a) $x_{11} = (3 \times 11) + 2 = 33 + 2 = 35$

b) Sum of the first 23 terms = $21 \times \text{Middle term} = 21 \times x_{11} = 21 \times 35 = 735$

15 The algebraic form of an arithmetic sequence is $2n - 1$.

a) What is its 12th term ?

b) What is sum of the first 23 terms of this sequence ?

Answer .

a) $x_{12} = (2 \times 12) - 1 = 24 - 1 = 23$

b) Sum of the first 23 terms = $23 \times \text{Middle term} = 23 \times x_{12} = 23 \times 23 = 529$

16 4th term of an arithmetic sequence is 9 and its 10th term is 21 .

a) What is its common difference ?

b) What is its 5th term ?

c) What is the sum of the first 9 terms of this sequence ?

Answer .

$$\text{a) } \text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{21-9}{10-4} = \frac{12}{6} = 2$$

$$\text{b) } x_5 = x_4 + d = 9 + 2 = 11$$

$$\text{c) Sum of the first 9 terms} = 9 \times \text{Middle term} = 9 \times x_5 = 9 \times 11 = 99$$

17 8th term of an arithmetic sequence is 33 and its 11th term is 45 .

a) What is its common difference ?

b) What is its 9th term ?

c) What is the sum of the first 17 terms of this sequence ?

Answer .

$$\text{a) } \text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{45-33}{11-8} = \frac{12}{3} = 4$$

$$\text{b) } x_9 = x_8 + d = 33 + 4 = 37$$

$$\text{c) Sum of the first 17 terms} = 17 \times \text{Middle term} = 17 \times x_9 = 17 \times 37 = 629$$

18 7th term of an arithmetic sequence is 22 and its 18th term is 55 .

a) What is its common difference ?

b) What is its 6th term ?

c) What is the sum of the first 11 terms of this sequence ?

Answer .

$$\text{a) } \text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{55-22}{18-7} = \frac{33}{11} = 3$$

$$\text{b) } x_6 = x_7 - d = 22 - 3 = 19$$

$$\text{c) Sum of the first 11 terms} = 11 \times \text{Middle term} = 11 \times x_6 = 11 \times 19 = 209$$

19 10th term of an arithmetic sequence is 21 and its 15th term is 31 .

a) What is its common difference ?

b) What is its 14th term ?

c) What is the sum of the first 27 terms of this sequence ?

Answer .

$$\text{a) } \text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{31-21}{15-10} = \frac{10}{5} = 2$$

$$\text{b) } x_{14} = x_{15} - d = 31 - 2 = 29$$

$$\text{c) } \text{Sum of the first 27 terms} = 25 \times \text{Middle term} = 25 \times x_{14} = 27 \times 29 = 783$$

20 The sum of first 7 terms of an arithmetic sequence is 56 and the sum of first 11 terms is 132 .

a) What is its fourth term ?

b) What is its sixth term ?

c) What is its common difference ?

d) What is its algebraic form ?

Answer .

$$\text{a) } x_4 = \frac{56}{7} = 8$$

$$\text{b) } x_6 = \frac{132}{11} = 12$$

$$\text{c) } \text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{12-8}{6-4} = \frac{4}{2} = 2$$

$$\text{d) } x_1 = x_4 - 3d = 8 - (3 \times 2) = 8 - 6 = 2$$

$$x_n = dn + f - d = 2n + 2 - 2 = 2n$$

21 The sum of first 5 terms of an arithmetic sequence is 65 and the sum of first 9 terms is 189 .

a) What is its third term ?

- b) What is its fifth term ?
- c) What is its common difference ?
- d) What is its algebraic form ?

Answer .

$$a) x_3 = \frac{65}{5} = 13$$

$$b) x_5 = \frac{189}{11} = 25$$

$$c) \text{ common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{25-13}{5-3} = \frac{8}{2} = 4$$

$$d) x_1 = x_3 - 2d = 13 - (2 \times 4) = 13 - 8 = 5$$

$$x_n = dn + f - d = 4n + 5 - 4 = 4n + 1$$

- 22 The sum of the first 3 terms of an arithmetic sequence is 30 and the sum of the first 13 terms is 520 .

- a) What is its second term ?
- b) What is its 7th term ?
- c) What is its common difference ?
- d) What is its algebraic form ?

Answer .

$$a) x_2 = \frac{30}{3} = 10$$

$$b) x_7 = \frac{520}{13} = 40$$

$$c) \text{ common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{40-10}{7-2} = \frac{30}{5} = 6$$

$$d) x_1 = x_2 - d = 10 - 6 = 4$$

$$x_n = dn + f - d = 6n + 4 - 6 = 6n - 2$$

23 Consider the arithmetic sequence 7, 10, 13, ...

a) What is its common difference ?

b) What is its 10th term ?

c) What is the sum of the first 10 terms of this sequence ?

Answer .

a) $d = 10 - 7 = 3$

b) $x_{10} = x_1 + 9d = 7 + (9 \times 3) = 7 + 27 = 34$

c) Sum of the first 10 terms = $\frac{10}{2} (7 + 34) = \frac{10}{2} \times 41 = 205$

24 Consider the arithmetic sequence 8, 14, 20, ...

a) What is its common difference ?

b) What is its 20th term ?

c) What is the sum of the first 20 terms of this sequence ?

Answer .

a) $d = 14 - 8 = 6$

b) $x_{20} = x_1 + 19d = 8 + (19 \times 6) = 8 + 114 = 122$

c) Sum of the first 20 terms = $\frac{20}{2} (8 + 122) = \frac{20}{2} \times 130 = 1300$

25 a) What is the 10th term of the arithmetic sequence 5, 10, 15, ... ?

b) What is the sum of the first 10 terms of the arithmetic sequence 5, 10, 15, ... ?

c) What is the sum of the first 10 terms of the arithmetic sequence 6, 11, 16, ... ?

Answer .

a) 50 $(x_{10} = x_1 + 9d = 5 + (9 \times 5) = 5 + 45 = 50)$

b) $\frac{10}{2} (x_1 + x_{10}) = \frac{10}{2} \times (5 + 50) = \frac{10}{2} \times 55 = 275$

c) $275 + (10 \times 5) = 275 + 50 = 325$

- 26 a) What is the 20th term of the arithmetic sequence 4 , 8 , 12 , ... ?
- b) What is the sum of the first 20 terms of the arithmetic sequence 4 , 8 , 12 , ... ?
- c) What is the sum of the first 20 terms of the arithmetic sequence 3 , 7 , 11 , ... ?

Answer .

- a) 80 $(x_{20} = x_1 + 19d = 4 + (19 \times 4) = 4 + 76 = 80)$
- b) $\frac{20}{2} (x_1 + x_{20}) = \frac{20}{2} \times (4 + 80) = \frac{20}{2} \times 84 = 840$
- c) $840 - (20 \times 1) = 840 - 20 = 820$

- 27 a) What is the 12th term of the arithmetic sequence 5 , 8 , 11 , ... ?
- b) What is the sum of the first 12 terms of the arithmetic sequence 5 , 8 , 11 , ... ?
- c) What is the sum of the first 12 terms of the arithmetic sequence 7 , 10 , 13 , ... ?

Answer .

- a) $x_{12} = f + 1d = 5 + (11 \times 3) = 5 + 33 = 38$
- b) $\frac{12}{2} (x_1 + x_{12}) = \frac{12}{2} \times (5 + 38) = \frac{12}{2} \times 43 = 258$
- c) $258 + (12 \times 2) = 258 + 24 = 282$

- 28 First term of an arithmetic sequence is 10 and its common difference is 7 .

- a) What is its 12th term ?
- b) What is the sum of the first 12 terms of this sequence ?

Answer .

- a) $x_{12} = x_1 + 11d = 10 + 11 \times 7 = 10 + 77 = 87$
- b) Sum of the first 12 terms = $\frac{12}{2} (10 + 87) = \frac{12}{2} \times 97 = 582$

- 29 Common difference of an arithmetic sequence is 4 and its 15th term 62 .

- a) What is its 16th term ?
- b) What is its first term ?
- c) What is the sum of the first 16 terms of this sequence ?

Answer .

a) $x_{16} = x_{15} + d = 62 + 4 = 66$

b) $x_1 = x_{15} - 14d = 62 - 14 \times 4 = 62 - 56 = 6$

c) Sum of the first 16 terms = $\frac{16}{2} (6 + 66) = \frac{16}{2} \times 72 = 576$

30 The algebraic form of an arithmetic sequence is $3n + 1$.

a) What is its first term ?

b) What is its 22nd term ?

c) What is the sum of the first 22 terms of this sequence ?

Answer .

a) $x_1 = (3 \times 1) + 1 = 3 + 1 = 4$

b) $x_{22} = (3 \times 22) + 1 = 66 + 1 = 67$

c) Sum of the first 22 terms = $\frac{22}{2} (4 + 67) = \frac{22}{2} \times 71 = 781$

31 The algebraic form of an arithmetic sequence is $5n - 4$.

a) What is its first term ?

b) What is its 8th term ?

c) What is the sum of the first 8 terms of this sequence ?

Answer .

a) $x_1 = (5 \times 1) - 4 = 5 - 4 = 1$

b) $x_8 = (5 \times 8) - 4 = 40 - 4 = 36$

c) Sum of the first 8 terms = $\frac{8}{2} (1 + 36) = \frac{8}{2} \times 37 = 148$

32 5th term of an arithmetic sequence is 15 and its 9th term is 23 .

a) What is its common difference ?

b) What is its 6th term ?

c) What is its first term ?

d) What is the sum of the first 6 terms of this sequence ?

Answer .

a) $common\ difference = \frac{Term\ difference}{Position\ difference} = \frac{23-15}{9-5} = \frac{8}{4} = 2$

b) $x_6 = x_5 + d = 15 + 2 = 17$

c) $x_1 = x_5 - 4d = 15 - (4 \times 2) = 15 - 8 = 7$

d) $Sum\ of\ the\ first\ 6\ terms = \frac{6}{2} (7 + 17) = \frac{6}{2} \times 24 = 72$

33 11th term of an arithmetic sequence is 31 and its 15th term is 43 .

a) What is its common difference ?

b) What is its 16th term ?

c) What is its first term ?

d) What is the sum of the first 16 terms of this sequence ?

Answer .

a) $common\ difference = \frac{Term\ difference}{Position\ difference} = \frac{43-31}{15-11} = \frac{12}{4} = 3$

b) $x_{16} = x_{15} + d = 43 + 3 = 46$

c) $x_1 = x_{15} - 14d = 43 - (14 \times 3) = 43 - 42 = 1$

d) $Sum\ of\ the\ first\ 16\ terms = \frac{16}{2} (1 + 46) = \frac{16}{2} \times 47 = 376$

34 The sum of first 9 terms of an arithmetic sequence is 99 and the sum of first 10 terms is 120 .

a) What is its 5th term ?

- b) What is its 10th term ?
- c) What is its common difference ?
- d) What is its algebraic form ?

Answer .

a) $x_5 = \frac{99}{9} = 11$

b) $x_{10} = S_{10} - S_9 = 120 - 99 = 21$

c) $\text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{21-11}{10-5} = \frac{10}{5} = 2$

d) $x_1 = x_5 - 4d = 11 - (4 \times 2) = 11 - 8 = 3$

$$x_n = dn + f - d = 2n + 3 - 2 = 2n + 1$$

- 35 The sum of first 5 terms of an arithmetic sequence is 130 and the sum of first 6 terms is 186 .

- a) What is its third term ?
- b) What is its 6th term ?
- c) What is its common difference ?
- d) What is its algebraic form ?

Answer .

a) $x_3 = \frac{130}{5} = 26$

b) $x_6 = S_6 - S_5 = 186 - 130 = 56$

c) $\text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{56-26}{6-3} = \frac{30}{3} = 10$

d) $x_1 = x_3 - 2d = 26 - (2 \times 10) = 26 - 20 = 6$

$$x_n = dn + f - d = 10n + 6 - 10 = 10n - 4$$

36 The sum of first 7 terms of an arithmetic sequence is 203 and the sum of first 8 terms is 264 .

- a) What is its 4th term ?
- b) What is its 8th term ?
- c) What is its common difference ?
- d) What is its algebraic form ?

Answer .

a) $x_4 = \frac{203}{7} = 29$

b) $x_8 = S_8 - S_7 = 264 - 203 = 61$

c) $\text{common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{61 - 29}{8 - 4} = \frac{32}{4} = 8$

d) $x_1 = x_4 - 3d = 29 - (3 \times 8) = 29 - 24 = 5$

$$x_n = dn + f - d = 8n + 5 - 8 = 8n - 3$$

37 Consider the sequence of two digit numbers which leave a remainder 1 on divisible by 2

- a) Which is the smallest number in this sequence ?
- b) What is its common difference ?
- c) How many two digit numbers are there which leave a remainder 1 on divisible by 2 ?
- d) What is the sum of such numbers ?

Answer .

a) Smallest number = 11

b) common difference = 2

c) Largest number = 99

$$\text{Position difference} = \frac{\text{Term difference}}{\text{common difference}} = \frac{99 - 11}{2} = \frac{88}{2} = 44$$

$$\text{Number of numbers} = 44 + 1 = 45$$

$$d) \text{ Sum} = \frac{45}{2} (11 + 99) = \frac{45}{2} \times 110 = 2475$$

38 Consider the sequence of three digit numbers which leave a remainder 2 on divisible by 5

- a) Which is the smallest number in this sequence ?
 b) What is its common difference ?
 c) How many three digit numbers are there which leave a remainder 2 on divisible by 5 ?
 d) What is the sum of such numbers ?

Answer .

a) Smallest number = 102

b) common difference = 5

c) Largest number = 997

$$\text{Position difference} = \frac{\text{Term difference}}{\text{common difference}} = \frac{997 - 102}{5} = \frac{895}{5} = 179$$

$$\text{Number} = 179 + 1 = 180$$

$$d) \text{ Sum} = \frac{180}{2} (102 + 997) = \frac{180}{2} \times 1099 = 98910$$

39 Consider the arithmetic sequence 9, 15, 21, ...

- a) What is its common difference ?
 b) What is the remainder when each term of this sequence is divided by 3 ?
 c) What is the sum of first 4 terms of this sequence ?
 d) Can the sum of any 20 terms of this sequence be 1000 ? Why ?

Answer .

a) $d = 15 - 9 = 6$

b) 0

c) Sum of the first 4 terms = $9 + 15 + 21 + 27 = 72$

d) No . The terms of this sequence are multiples of 3 .The sum of the multiples of 3 is also a multiple of 3 . But 1000 is not a multiple of 3 .

40 Consider the arithmetic sequence 8 , 20 , 32 , . . .

a) What is its common difference ?

b) What is the remainder when each term of this sequence is divided by 4 ?

c) What is the sum of first 5 terms of this sequence ?

d) Can the sum of any 30 terms of this sequence be 750 ? Why ?

Answer .

a) $d = 20 - 8 = 12$

b) 0

c) Sum of the first 5 terms = $8 + 12 + 16 + 20 + 24 = 80$

d) No . The terms of this sequence are multiples of 4 .The sum of the multiples of 4 is also a multiple of 4 . But 750 is not a multiple of 4 .

41 Consider the arithmetic sequence 7 , 13 , 19 , . . .

a) What is its common difference ?

b) Write down the next three more terms of this sequence ?

c) What is its algebraic form ?

d) Can the sum of any 11 terms of this sequence be 300 ? Why ?

Answer .

a) $d = 13 - 7 = 6$

b) 25 , 31 , 37

c) $x_n = dn + f - d = 6n + 7 - 6 = 6n + 1$

d) No. All the terms of this sequence are odd numbers . The sum of 11 odd numbers is an odd number .

42 Consider the arithmetic sequence 5, 9, 13, . . .

- a) What is its common difference ?
- b) Write down the next three more terms of this sequence ?
- c) What is its algebraic form ?
- d) Can the sum of any 15 terms of this sequence be 376 ? Why ?

Answer .

- a) $d = 9 - 5 = 4$
- b) 17, 21, 25
- c) $x_n = dn + f - d = 4n + 5 - 4 = 4n + 1$
- c) No .All the terms of this sequence are odd numbers .The sum of 15s odd numbers is an odd number .

43 Consider the arithmetic sequence 7, 13, 19, . . .

- a) What is its common difference ?
- b) Write down the next three more terms of this sequence ?
- c) What is its algebraic form ?
- d) Is the sum any two terms of this sequence again a term of this sequence ? Why ?

Answer .

- a) $d = 13 - 7 = 6$
- b) 25, 31, 37
- c) $x_n = dn + f - d = 6n + 7 - 6 = 6n + 1$
- c) No .All the terms of this sequence are odd numbers .The sum of two odd numbers is an even number .

44 a) What is the common difference of the sequence 5, 10, 15, . . . ?

b) What is the common difference of the sequence 6, 11, 21, . . . ?

c) What is the difference between the 15 terms of these sequences ?

d) What is the difference between the sum of the first 15 terms of these sequences ?

Answer .

- a) 5
- b) 5
- c) 1
- d) $15 \times 1 = 15$

- 45
- a) What is the common difference of the sequence 5, 8, 11, ... ?
 - b) What is the common difference of the sequence 7, 10, 13, ... ?
 - c) What is the difference between the 11 terms of these sequences ?
 - d) What is the difference between the sum of the first 11 terms of these sequences ?

Answer .

- a) 3
- b) 3
- c) 2
- d) $11 \times 2 = 22$

- 46
- a) What is the common difference of the sequence 6, 10, 14, ... ?
 - b) What is the common difference of the sequence 9, 13, 17, ... ?
 - c) What is the difference between the 20 terms of these sequences ?
 - d) What is the difference between the sum of the first 20 terms of these sequences ?

Answer .

- a) 4
- b) 4
- c) 3
- d) $20 \times 3 = 60$

47 Look at the number pattern given below.

1

2 3

4 5 6

7 8 9 10

.....

.....

- a) Write down the next two more lines of this pattern ?
- b) What is the last number in the 9th line ?
- c) What is the last number in the 10th line ?
- d) What is the sum of the numbers in the 10th line ?

Answer .

a) 11 , 12 , 13 , 14 , 15

16 , 17 , 18 , 19 , 20 , 21

b) Last number in the 9th line = $\frac{9 \times 10}{2} = 45$

c) Last number in the 10th line = $\frac{10 \times 11}{2} = 55$

d) First number in the 10th line = $45 + 1 = 46$

Sum of the numbers in the 10th line = $\frac{10}{2} (46 + 55) = \frac{10}{2} \times 101 = 505$

OR

Sum of the numbers in the 10th line = $\frac{(55 \times 56)}{2} - \frac{45 \times 46}{2}$
 $= 1540 - 1035 = 505$

48 Look at the number pattern given below.

1

2 3

4 5 6

7 8 9 10

.....

.....

- a) Write down the next two more lines of this pattern ?
b) What is the last number in the 14th line ?
c) What is the first number in the 15th line ?
d) What is the last number in the 15th line ?

Answer .

a) 11 , 12 , 13 , 14 , 15

16 , 17 , 18 , 19 , 20 , 21

b) Last number in the 14th line = $\frac{14 \times 15}{2} = 105$

c) First number in the 15th line = $105 + 1 = 106$

d) Last number in the 15th line = $\frac{15 \times 16}{2} = 120$

49 Look at the number patterns given below.

1

2 3

4 5 6

7 8 9 10

.....

.....

(Pattern 1)

3

6 9

12 15 18

21 24 27 30

.....

.....

(Pattern 2)

- a) Write down the next two more lines of the first pattern ?
- b) What is the last number in the 10th line of the first pattern ?
- c) What is the algebraic form of the arithmetic sequence 3, 6, 9, . . . ?
- d) What is the last number in the 10th line of the second pattern ?

Answer .

- a) 11 12 13 14 15
16 17 18 19 20 21

b) Last number in the 10th line of the first pattern = $\frac{10 \times 11}{2} = 55$

c) $x_n = dn + f - d = 3n + 3 - 3 = 3n$

d) $3 \times 55 = 165$

50 Look at the number patterns given below.

1
2 3
4 5 6
7 8 9 10
.....
.....

(Pattern 1)

4
7 10
13 16 19
22 25 28 31
.....
.....

(Pattern 2)

- a) Write down the next two more lines of the first pattern ?
- b) What is the last number in the 20th line of the first pattern ?
- c) What is the algebraic form of the arithmetic sequence 4, 7, 10, . . . ?
- d) What is the last number in the 20th line of the second pattern ?

Answer .

a) 11 12 13 14 15

16 17 18 19 20 21

b) Last number in the 20th line of the first pattern = $\frac{20 \times 21}{2} = 210$

c) $x_n = dn + f - d = 3n + 4 - 3 = 3n + 1$

d) $(3 \times 210) + 1 = 630 + 1 = 631$

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