

10th Maths - Important 2,5 Mark Question
Chapter - 2
Numbers and sequences.

Exercise	Example
$2 \cdot 1 \rightarrow 3, 5, 6, 7$	$2 \cdot 4, 2 \cdot 5, 2 \cdot 6, 2 \cdot 15,$
$2 \cdot 2 \rightarrow 3, 4, 7, 8, 9$	$2 \cdot 14, 2 \cdot 22, 2 \cdot 25,$
$2 \cdot 3 \rightarrow 1, 4$	$2 \cdot 29, 2 \cdot 31, 2 \cdot 33,$
$2 \cdot 4 \rightarrow 1, 5$	$2 \cdot 34, 2 \cdot 36, 2 \cdot 38,$
$2 \cdot 5 \rightarrow 4, 5, 8, 11, 12, 13$	$2 \cdot 39, 2 \cdot 43, 2 \cdot 44,$
$2 \cdot 6 \rightarrow 3, 6, 7, 9, 11$	$2 \cdot 45, 2 \cdot 47, 2 \cdot 51,$
$2 \cdot 7 \rightarrow 3, 7, 9$	$2 \cdot 51.$
$2 \cdot 8 \rightarrow 3, 6$	
$2 \cdot 9 \rightarrow 2, 3, 5, 6$	

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CHAPTER - 2

Numbers and Sequences.

- 1) If the Highest Common Factor of 210 and 55 is expressible in the form $55x - 325$, find x .
Example: 2.4
- 2) Find the greatest number that will divide 445 and 512 leaving remainders 4 and 5 respectively
Example: 2.5
- 3) Find the HCF of 396, 504, 636.
Example: 2.6
- 4) Prove that the product of two consecutive positive integers is divisible by 2.
Exercise: 2.1(3)
- 5) Prove that Square of any integer leaves the remainder either 0 or 1 when divided by 4.
Exercise: 2.1(5)
- 6) Use Euclid's Division Algorithm to find the Highest common Factor (HCF) of
 - i) 340 and 412
 - ii) 867 and 255
 - iii) 10224 and 9648
 - iv) 84, 90 and 120
Exercise: 2.1(6)
- 7) Find the largest number which divides 1230 and 1926 leaving remainder 12 in each case.
Exercise: 2.1(7)
- 8) Find the HCF of 252525 and 363636
Exercise: 2.2(3)
- 9) If $13824 = 2^a \times 3^b$ then find a and b .
Exercise: 2.2(4)

10) Find the greatest number consisting of 6 digits which is exactly divisible by 24, 15, 36?

Exercise: 2.2(7)

11) what is the smallest number that when divided by three numbers such as 35, 56 and 91 leaves remainder 7 in each case?

Exercise: 2.2(8)

12) Find the least number that is divisible by the first ten natural numbers.

Exercise: 2.2(9)

13) Find the least positive value of x such that

$$i) 67 + x \equiv 1 \pmod{4}$$

$$ii) 98 \equiv (x+4) \pmod{5}$$

Example: 2.13

16) Solve $8x \equiv 1 \pmod{11}$

Example: 2.14

17) Compute x , such that $10^4 \equiv x \pmod{19}$

Example: 2.15

18) Find the least positive value of x such that

$$(i) 71 \equiv x \pmod{8}$$

$$(ii) 78 + x \equiv 1 \pmod{5}$$

$$(iii) 89 \equiv (x+3) \pmod{4}$$

$$(iv) 96 \equiv \frac{x}{7} \pmod{5}$$

$$(v) 5x \equiv 4 \pmod{6}$$

Exercise: 2.3(1)

19) Solve $3x - 2 \equiv 0 \pmod{11}$

Exercise: 2.3(4)

20) Find the first five terms of the following sequence.

$$a_1 = 1, a_2 = 1, a_n = \frac{a_{n-1}}{a_{n-2} + 3}; n \geq 3, n \in \mathbb{N}$$

Example: 2.22

21) Find the next three terms of the following sequence.

(i) 8, 24, 72,

(ii) 5, 1, -3,

(iii) $\frac{1}{4}$, $\frac{2}{9}$, $\frac{3}{16}$,

Exercise : 2.4 (1)

22) Find a_8 and a_{15} whose n^{th} term is

$$a_n = \begin{cases} \frac{n^2 - 1}{n + 3} ; n \text{ is even, } n \in \mathbb{N} \\ \frac{n^2}{2n + 1} ; n \text{ is odd, } n \in \mathbb{N} \end{cases}$$

Exercise : 2.4 (5)

23) Find the 15^{th} , 24^{th} and n^{th} term (general term) of an A.P given by 3, 15, 27, 39,

Example : 2.25

24) In an A.P, sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

Example : 2.29

25) Find the 19^{th} term of an A.P. -11, -15, -19,

Exercise : 2.5 (4)

26) which term of an A.P. 16, 11, 6, 1, is -54?

Exercise : 2.5 (5)

27) If $3 + k$, $18 - k$, $5k + 1$ are in A.P. then Find k .

Exercise : 2.5 (8)

28) The sum of three consecutive terms that are in A.P is 27 and their product is 288. Find the three terms.

Exercise : 2.5 (11)

- 29) The ratio of 6th and 8th term of an A.P is 7:9. Find the ratio of 9th term to 13th term.

Exercise: 2.5(12).

- 30) In a winter season let us take the temperature of Cooty from Monday to Friday to be in A.P. The sum of temperatures from Monday to Wednesday is 0°C and the sum of the temperatures from Wednesday to Friday is 18°C . Find the temperatures on each of the five days.

Exercise: 2.5(13)

- 31) Find the sum of first 15 terms of the A.P.

$$8, 7\frac{1}{4}, 6\frac{1}{2}, 5\frac{3}{4}, \dots$$

Example: 2.31

- 32) How many terms of the series $1+5+9+\dots$ must be taken so that their sum is 190?

Example: 2.33

- 33) The 13th term of an A.P is 3 and the sum of first 13 terms is 234. Find the common difference and the sum of first 21 terms.

Example: 2.34

- 34) Find the sum of all natural numbers between 300 and 600 which are divisible by 7.

Example: 2.36

- 35) The houses of a street are numbered from 1 to 49. Senthil's house is numbered such that the sum of numbers of the houses prior to Senthil's house is equal to the sum of numbers of the houses following Senthil's house. Find Senthil's house number?

Example: 2.38

36) The sum of first n , $2n$ and $3n$ terms of an A.P are S_1 , S_2 and S_3 respectively, prove that $S_3 = 3(S_2 - S_1)$ Example: 2.39

37) Find the sum of first 28 terms of an A.P. whose n^{th} term is $4n - 3$. Exercise: 2.6 (3)

38) Find the sum of all odd positive integers less than 450. Exercise: 2.6 (6)

39) Find the sum of all natural numbers between 602 and 902 which are not divisible by 4. Exercise: 2.6 (7)

40) A man repays a loan of ₹65,000 by paying ₹400 in the first month and then increasing the payment by ₹300 every month. How long will it take for him to clear the loan? Exercise: 2.6 (9)

41) If $S_1, S_2, S_3, \dots, S_m$ are the sums of n terms of m A.Ps. whose first terms are $1, 2, 3, \dots, m$ and whose common differences are $1, 3, 5, \dots, (2m-1)$ respectively, then show that $S_1 + S_2 + S_3 + \dots + S_m = \frac{1}{2} mn(mn+1)$. Exercise: 2.6 (11)

42) In a Geometric progression, the 4th term is $\frac{8}{9}$ and the 7th term is $\frac{64}{243}$. Find the Geometric progression. Example: 2.43

43) The product of three consecutive terms of a Geometric progression is 343 and their sum is $\frac{91}{3}$. Find the three terms.

Example : 2.44

44) The present value of a machine is ₹40,000 and its value depreciates each year by 10%. Find the estimated value of the machine in the 6th year.

Example : 2.45

45) In a G.P 729, 243, 81, Find t_7 .

Exercise : 2.7(3)

46) Find the 10th term of a G.P whose 8th term is 768 and the common ratio is 2.

Exercise : 2.7(7)

47) In a G.P the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$. Find the three terms.

Exercise : 2.7(9)

48) Find the first term of a G.P in which $S_6 = 4095$ and $r=4$.

Example : 2.47

49) Find the sum to n terms of the series $5 + 55 + 555 + \dots$

Example : 2.51

50) Find the first term of the G.P whose common ratio 5 and whose sum to first 6 terms is 46872.

Exercise : 2.8(3)

51) Find the sum to n terms of the series.

(i) $0.4 + 0.44 + 0.444 + \dots$ to n terms.

(ii) $3 + 33 + 333 + \dots$ to n terms.

Exercise : 2.8(6)

52) Find the sum of

(i) $1^3 + 2^3 + 3^3 + \dots + 16^3$

(ii) $9^3 + 10^3 + \dots + 21^3$

Example: 2.57

53) If $1^3 + 2^3 + 3^3 + \dots + k^3 = 44100$ then

find $1 + 2 + 3 + \dots + k$.

Exercise: 2.9(3)

54) If $1 + 2 + 3 + \dots + k = 325$, then find

$1^3 + 2^3 + 3^3 + \dots + k^3$

Exercise: 2.9(2)

55) The sum of the cubes of the first n natural numbers is 2025, then find the value of n .

Exercise: 2.9(5)

56) Rexha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, ..., 24 cm. How much area can be decorated with these colour papers?

Exercise: 2.9(6)