Term	1st	2nd	3rd	4th	5th	6th	.....	57th	58th	.....	nth
Value	2	6	10	14				?	?		4n - 2

a) Write the next two term of the following sequences [1]
b) Write the n^{th} term of the sequence [1]
c) Write the 57^{th} and 58^{th} of the sequence [1]

1) Consecutive No Sequence

1, 2, 3, 4, 5, 6, 7 , ____ , ____ n^{th} term = _____ 50^{th} term = _____

Shifted Sequence

i) 2, 3, 4, 5, 6, 7, 8, ____, ____ n^{th} term = _____ 70^{th} term = _____

ii) 3, 4, 5, 6, 7, 8, 9, ____, _____ n^{th} term = _____ 35^{th} term = _____

iii) 0, 1, 2, 3, 4, 5, 6, ____, _____ n^{th} term = _____ 22^{nd} term = _____

iv) -1, 0, 1, 2, 3, 4, 5, ____, _____ n^{th} term = _____ 65^{th} term = _____

v) -2, -1, 0, 1, 2, 3, 4, 5, ____, _____ n^{th} term = _____ 17^{th} term = _____

2) Square Sequence (Basic)

1, 4, 9, 16, 25, 36, ____, _____ n^{th} term = _____ 12^{th} term = _____

Shifted Sequence

i) 4, 9, 16, 25, 36, 49, _____, _____ n^{th} term = _____ 19^{th} term = _____

ii) 9, 16, 25, 36, 49, _____ , _____ n^{th} term = _____ 38^{th} term= _____

3) Cube Sequence (Basic)

1, 8, 27, 64, ____, ____ n^{th} term = _____ 20^{th} term= _____

Shifted Sequence

i) 8, 27, 64, 125, ____, _____ n^{th} term = _____ 29^{th} term= _____

ii) 27, 64, 125, ____, _____ n^{th} term = _____ 48^{th} term= _____

[Past Paper Question]

(a) Find the nth term of 3, 10, 29, 66, 127, … [2]

(b) Find the nth term of 0, 7,26,63,124….. [2]

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4) Linear or First Level Common Difference

nth term : - a + d(n-1) where a = 1st term and d = common difference

i) 2, 4, 6, 8, 10, ____, _____ n^{th} term = _____ 11^{th} term = _____

ii) 5,10,15,20,25,30, ____, _____ n^{th} term = _____ 20^{th} term = _____

iii)2, 5, 8, 11, ____ , _____ n^{th} term = _____ 21^{st} term = _____

iv) 1, 5, 9, 13, 17, _____, _____ n^{th} term = _____ 31^{st} term = _____

v) 17, 12, 7, 2, _____, _____ n^{th} term = _____ 31^{st} term = _____

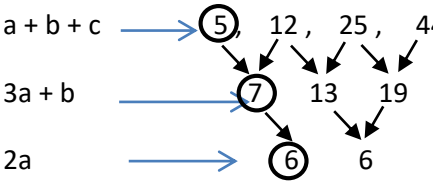
vi) 18, 15.5, 13, 10.5, _____, _____ n^{th} term = _____ 11^{th} term = _____

vii) 20, 17, 14, 11, _____, _____ n^{th} term = _____ 12^{th} term = _____

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5) Quadratic Sequence or Second Level Common Difference

nth term : $\mathbf{an^2 + bn + c}$ where



so nth term = $3n^2 - 2n + 4$

i) 3, 5, 11, 21, 35, _____, _____ n^{th} term =

ii) 2,9,20,35,54, _____, _____ n^{th} term =

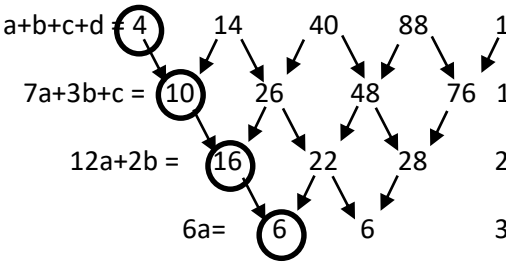
iii) 2, 4, 8, 14, 22, 32, _____, _____ n^{th} term =

iv) 6, 9, 14, 21, 30 , _____ , _____ n^{th} term =

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6) <u>Cubic Sequence or third level common difference</u>

nth term : $an^3 + bn^2 + cn + d$



6a = 6 so a =1

12a + 2b = 16 so b = 2

7a+3b+c = 10 so c = -3

a+b+c+d = 4 so d = 4

S0 nth term is $n^3 + 2n^2 - 3n + 4$

(i) 0,7,26,63,124…… n^{th} term :

(ii) 8,15,34,71,132, …… n^{th} term :

(iii) 3,17,55,129,251, ……. n^{th} term :

(iv)3,10,29,66 ,127, ……. n^{th} term :

(v) 11,6,−25,−100,−237,…… n^{th} term :

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7) Geometric Sequence or Exponential Sequence

Formula ar^{n-1} , where a is the first term and r is the common ratio (eg 2^{nd} term/ 1^{st} term)

i) 2,4,8,16,32 , _____ , _____ n^{th} term =

ii) 1, 2,4,8,16, _____ , _____ n^{th} term =

iii) 1/3 , 1 , 3 , 9 , 27, _____ , _____ n^{th} term =

iv) 3, 6, 12, 24, _____ , _____ n^{th} term =

v) 256, 64, 16 , 4 , _____ , _____ n^{th} term =

vi) 1 , -2 , 4 , -8 , 16 , _____ , _____ n^{th} term =

vii) 3 , $3\sqrt{3}$, 9 , $9\sqrt{3}$, 27 , _____ , _____ n^{th} term =

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8) Fibonacci Sequence (add previous two terms to get next term)

1, 1, 2, 3, 5, 8, 13, ____, _____

Answers

1) n (i) n + 1 (ii) n + 2 (iii) n - 1 (iv) n - 2 (v) n - 3
2) n^2 (i) $(n+1)^2$ (ii) $(n+2)^2$
3) n^3 (i) $(n+1)^3$(iii) $(n+2)^3$
Past Paper Question (a) n^3+2 (b) Answer $n^3- 1$
4) (i) 2n (ii) 5n (iii) 3n-1 (iv) 4n - 3 (v) -5n + 22 (vi) -2.5n + 20.5 (vii) -3n + 23
5) (i) $2n^2 - 4n + 5$ (ii) $2n^2 + n - 1$ (iii) $n^2 - n + 2$ (iv) $n^2 + 5$
6) (i)n^3-1 (ii)$n^3 + 7$ (iii)$2n^3 + 1$ (iv) $n^3 + 2$ (v) $-3n^3 + 5n^2 + n + 8$
7) (i) 2x 2^{n-1} $(=2^n)$ (ii) 1x 2^{n-1} (iii) 1/3 x 3^{n-1} $(= 3^{n-2})$(iv) 3 x 2^{n-1} (v) 256 $(1/4)^{n-1}$ $(= 4^{5-n})$ (vi) 1 x$(-2)^{n-1}$ (vii) 3x$(\sqrt{3})^{n-1}$ $(= 3^{\frac{n+1}{2}})$
8) 21 , 34

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