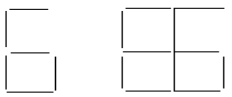
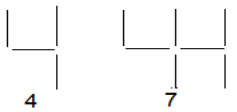
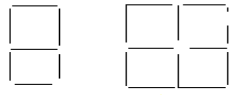
EXERCISE 12.4

1.Observe the patterns of digits made from line segments of equal length. You will find such segmented digits on the display of electronic watches or calculators.

(a) 
6 11 16 21 ... ... 5n + 1

(b) 
4 7 10 13 ... ... 3n + 1

(c) 
7 12 17 22 ... ... 5n + 2

If the number of digits are formed is taken to be n the number of segments required to form n digits given by algebraic expression appearing on the right of each pattern . How many segments are required to form 5, 10, 100 digits of the kind 

Sol. :- *(a) Number segments are required to form 5 digits = 5(5) + 1 = 25 + 1 = 26*

Number segments are required to form 10 digits = 5(10) + 1 = 50 + 1 = 51

Number segments are required to form 100 digits = 5(100) + 1 = 500 + 1 = 501

(b) Number segments are required to form 5 digits = 3(5) + 1 = 15 + 1 = 16

Number segments are required to form 10 digits = 3(10) + 1 = 30 + 1 = 31

Number segments are required to form 100 digits = 3(100) + 1 = 300 + 1 = 301

(c) Number segments are required to form 5 digits = 5(5) + 2 = 25 + 2 = 27

Number segments are required to form 10 digits = 5(10) + 2 = 50 + 2 = 52

Number segments are required to form 100 digits = 5(100) + 2 = 500 + 2 = 502

2.Use the given expression to complete the table of number patterns.

S. No.	***Expressions***	***Terms***								
		1st	***2nd***	***3rd***	***4th***	***5th***	***...***	***10th***	***...***	***100th***
(i)	***2n – 1***	***1***	***3***	***5***	***7***	***9***	***-***	***19***	***-***	
(ii)	***3n + 2***	***5***	***8***	***11***	***14***		***-***		***-***	
(iii)	***4n + 1***	***5***	***9***	***13***	***17***		***-***		***-***	
(iv)	***7n + 20***	***27***	***34***	***41***	***48***		***-***		***-***	
(v)	***$n^2 + 1$***	***2***	***5***	***10***	***17***		***-***		***-***	***10001***

Sol.:-*(i) From table (2n - 1)*

For n = 100,

2(100) – 1 = 200 – 1 = 199

(ii) From table 3n + 2

For n = 5 ,	*For n = 10,*	*For n = 100*
= 3(5) + 2	*= 3(10) + 2*	*=3(100) + 2*
= 15 + 2 = 17	*= 30 + 2 = 32*	*= 300 + 2 = 302*

(iii) From table 4n + 1

For n = 5 ,	*For n = 10,*	*For n = 100*
= 4(5) + 1	*= 4(10) + 1*	*=4(100) + 1*
= 20 + 1 = 21	*= 40 + 1 = 41*	*= 400 + 1 = 401*

(iv) From table 7n + 20

For n = 5 ,	*For n = 10,*	*For n = 100*
= 7(5) + 20	*= 7(10) + 20*	*= 7(100) + 20*
= 35 + 20 = 55	*= 70 + 20 = 90*	*= 700 + 20 = 720*

(v) From table $n^2 + 1$

For n = 5 ,	*For n = 10,*
= $(5)^2 + 1$	*= $(10)^2 + 1$*
= 25 + 1 = 26	*= 100 + 1 = 101*

S. No.	*Expressions*	*Terms*								
		1^{st}	*2^{nd}*	*3^{rd}*	*4^{th}*	*5^{th}*	*...*	*10^{th}*	*...*	*100^{th}*
(i)	*2n – 1*	*1*	*3*	*5*	*7*	*9*	-	*19*	-	*199*
(ii)	*3n + 2*	*5*	*8*	*11*	*14*	*17*	-	*32*	-	*302*
(iii)	*4n + 1*	*5*	*9*	*13*	*17*	*21*	-	*41*	-	*401*
(iv)	*7n + 20*	*27*	*34*	*41*	*48*	*55*	-	*90*	-	*720*
(v)	*$n^2 + 1$*	*2*	*5*	*10*	*17*	*26*	-	*101*	-	*10001*

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