



SpeedLabs

MATHS




CBSE 7<sup>th</sup>




TEEVRA EDUTECH PVT. LTD.

# Algebraic Expressions

## Exercise-12.4

**Q.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...       $(5n + 1) \dots$

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

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

If the number of digits formed is taken to be  $n$ , the number of segments required to form  $n$  digits is given by the 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) It is given that the number of segments required to form  $n$  digits of the kind 6 is  $(5n + 1)$ .

Number of segments required to form 5 digits =  $(5 \times 5 + 1) = 25 + 1 = 26$

Number of segments required to form 10 digits =  $(5 \times 10 + 1) = 50 + 1 = 51$

Number of segments required to form 100 digits =  $(5 \times 100 + 1) = 500 + 1 = 501$

(b) It is given that the number of segments required to form  $n$  digits of the kind 4 is  $(3n + 1)$ .

Number of segments required to form 5 digits =  $(3 \times 5 + 1) = 15 + 1 = 16$

Number of segments required to form 10 digits =  $(3 \times 10 + 1) = 30 + 1 = 31$

Number of segments required to form 100 digits =  $(3 \times 100 + 1) = 300 + 1 = 301$

(c) It is given that the number of segments required to form  $n$  digits of the kind 8 is  $(5n + 2)$ .

Number of segments required to form 5 digits =  $(5 \times 5 + 2) = 25 + 2 = 27$

Number of segments required to form 10 digits =  $(5 \times 10 + 2) = 50 + 2 = 52$

Number of segments required to form 100 digits =  $(5 \times 100 + 2) = 500 + 2 = 502$

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

S. No	Expression	Terms									
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	...	10 <sup>th</sup>	...	100 <sup>th</sup>	...
(i)	$2n - 1$	1	3	5	7	9	-	19	-	-	-
(ii)	$3n + 2$	2	5	8	11	-	-	-	-	-	-
(iii)	$4n + 1$	5	9	13	17	-	-	-	-	-	-

(iv)	$7n + 20$	27	34	41	48	-	-	-	-	-	-
(v)	$n^2 + 1$	2	5	10	17	-	-	-	-	10,001	-

Sol:

S. No	Expression	Terms									
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	...	10 <sup>th</sup>	...	100 <sup>th</sup>	...
(i)	$2n - 1$	1	3	5	7	9	-	19	-	199	-
(ii)	$3n + 2$	2	5	8	11	17	-	32	-	302	-
(iii)	$4n + 1$	5	9	13	17	21	-	41	-	401	-
(iv)	$7n + 20$	27	34	41	48	55	-	90	-	702	-
(v)	$n^2 + 1$	2	5	10	17	26	-	101	-	10,001	-