Board –CBSE	Class – 6th	Topic – Algebra Ex:11.1

Exercise 11.1

1. Find the rule which gives the number of matchsticks required to make the following matchsticks patterns. Use a variable to write the rule.

(a) A pattern of letter T as T

(b) A pattern of letter Z as Z

(c) A pattern of letter U as U

(d) A pattern of letter V as V

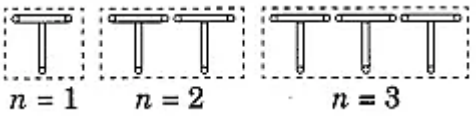
(e) A pattern of letter E as E

(f) A pattern of letter S as S

(g) A pattern of letter A as A

Ans. Number of matchsticks required to make the pattern of T

(a)



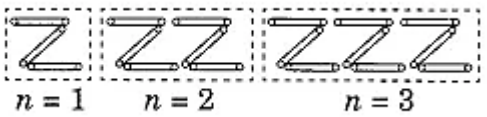
For n = 1 is 2 × n

For n = 2 is 2 × n

For n = 3 is × n

∴ The rule is 2n where n is the number of Ts.

(b)



The number of matchsticks required to make the pattern of Z.

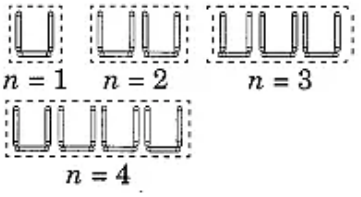
For n = 1 is 3 × n

For n = 2 is 3 × n

For n = 3 is 3 × n

∴ The rule is 3n where n is the number of Zs.

(c)



The number of matchsticks required to make the pattern U.

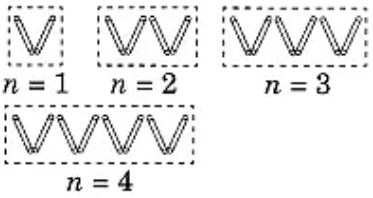
For n = 1 is 3 × n

For n = 2 is 3 × n

For n = 3 is 3 × n

For n = 4 is 3 × n

∴ Rule is 3n where n is number of Us.

(d) 

Number of matchsticks required

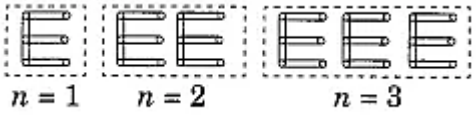
For n = 1 is 2 × n

For n = 2 is 2 × n

For n = 3 is 2 × n

For n = 4 is 2 × n

∴ The rule is 2n where n is the number of Vs.

(e) 

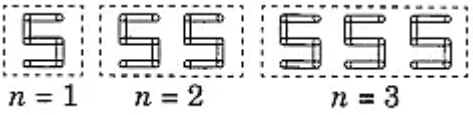
Number of matchsticks required

For n = 1 is 5 × n

For n = 2 is 5 × n

For n = 3 is 5 × n

∴ The rule is 5n where n is the number of Es.

(f) 

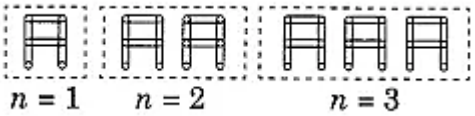
Number of matchsticks required

For n = 1 is 5 × n

For n = 2 is 5 × n

For n = 3 is 5 × n

∴ The rule is 5n where n is the number of Ss.

(g) 

Number of matchsticks required

For n = 1 is 6 × n

For n = 2 is 6 × n

For n = 3 is 6 × n

∴ The rule is 6n where n is the number of As.

2. We already know the rule for the pattern of letters L, C, and F. Some of the letters from Ql. (given above) give us the same rule as that given by L. Which are these? Why does this happen?

Ans. The rule for the following letters

For L it is 2n For C it is 2n For V it is 2n

For F it is 3n For T it is 3n For U it is 3n

We observe that the rule is the same for L, V, and T as they require only 2 matchsticks.

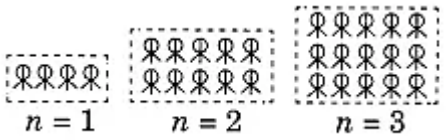
Letters C, F, and U have the same rule, i.e., 3n as they require only 3 sticks.

3. Cadets are marching in a parade. There are 5 cadets in a row.

What is the rule that gives the number of cadets, given the number of rows? (use n for the number of rows.)

Ans. Number of cadets in a row = 5

Number of rows = n



Number of cadets

For n = 1 is 5 × n

For n = 2 is 5 × n

For n = 3 is 5 × n

∴ The rule is 5n where n is the number of rows.

4. If there are 50 mangoes in a box, how will you write the total number of mangoes in terms of the number of boxes? (Use b for the number of boxes.)

Ans. Number of boxes = b

Number of mangoes in a box = 50

Number of mangoes,

For n = 1 is 50 × b

For n = 2 is 50 × b

For n = 3 is 50 × b

∴ The rule is 50b where b represents the number of boxes.

5. The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students.)

Ans. Number of students = s

Number of pencils distributed per student = 5

Number of pencils required

For n = 1 is 5 × s

For n = 2 is 5 × s

For n = 3 is 5 × s

∴ The rule is 5s where s represents the number of students.

6. A bird flies 1 kilometer in one minute. Can you express the distance covered by the bird in terms of its flying time in minutes? (Use t for flying time in minutes.)

Ans. Distance covered in 1 minute = 1 km.

The flying time = t

Distance covered

For n = 1 is 1 × t km

For n = 2 is 1 × t km

For n = 3 is 1 × t km

∴ The rule is 1.t km where t represents the flying time.

7. Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder). She has a dot in a row. How many dots will her rangoli have for r rows?

How many dots are there if there are 8 rows? If there are 10 rows?

Ans. Number of rows = r

Number of dots in a row drawn by Radha = 8

∴ The number of dots required

For r = 1 is 8 × r

For r = 2 is 8 × r

For r = 3 is 8 × r

∴ The rule is 8r where r represents the number of rows.

For r = 8, the number of dots = 8 × 8 = 64

For r = 10, the number of dots = 8 × 10 = 80

8. Leela is Radha's younger sister. Leela is 4 years younger than Radha.

Can you write Leela's age in terms of Radha's age? Take Radha's age to be x years.

Ans. Radha's age = x yeas.

Given that Leela's age

= Radha's age – 4 years

= x years – 4 years

= (x – 4) years

9. Mother has made laddus. She gives some laddus to guests and family members, still, 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?

Ans. Given that the number of laddus given away = l

Number of laddus left = 5

∴ Number of laddus made by mother = l + 5

10. Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still, 10 oranges remain outside. If the number of oranges in a small box is taken to be x, What is the number of oranges in the larger box?

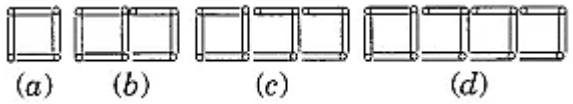
Ans. Given that, the number of oranges in smaller box = x

∴ Number of oranges in bigger box = 2(number of oranges in the small box) + (Number of oranges remain outside)

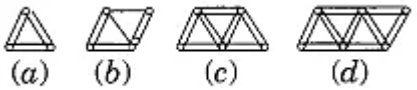
So, the number of oranges in bigger box = 2x + 10

11. (a) Look at the following matchstick pattern of the square. The squares are not separate. Two neighboring squares have a common matchstick. Observe the patterns and find the rule that gives the number of matchsticks in terms of the number of squares.

(Hint: If you remove the vertical stick at the end, you will get a pattern of Cs)



(b) Following figure gives a matchstick pattern of triangles. As in Exercise 11(a) above, find the general rule that gives the number of matchsticks in terms of the number of triangles.



Ans. (a) Let n be the number of squares.

∴ Number of matchsticks required

For n = 1 is 3 x n + l = 3n + 1 = 4

For n = 2is 3 x n + l = 3n + 1 = 7

For n = 3is 3 x n + l = 3n + 1 = 10

For n = 4is 3 x n + l = 3n + 1 = 13

∴ Rule is 3n + 1 where n represents the number of squares.

(b) Let n be the number of triangles.

∴ Number of matchsticks required

For n = 1 is 2n + 1 = 3

For n = 2 is 2n + 1 = 5

For n = 3 is 2n + 1 = 7

For n = 4 is 2n + 1 = 9

∴ Rule is 2n + 1 where n represents the number of matchsticks.