EXERCISE 11.1 PAGE NO: 226

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

(b) A pattern of letter Z as

(c) A pattern of letter U as

(d) A pattern of letter Vas

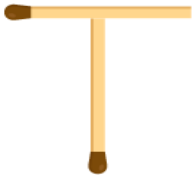
(e) A pattern of letter E as

(f) A pattern of letter S as

(g) A pattern of letter A as

Solutions:

(a)

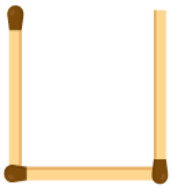


From the figure we observe that two matchsticks are required to make a letter T. Hence, the pattern is 2n

(b)

From the figure we observe that three matchsticks are required to make a letter Z. Hence, the pattern is 3n

(c)

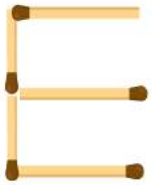


From the figure we observe that three matchsticks are required to make a letter U. Hence, the pattern is 3n

(d)

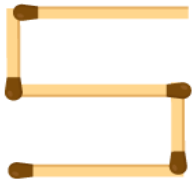
From the figure we observe that two matchsticks are required to make a letter V. Hence, the pattern is 2n

(e)



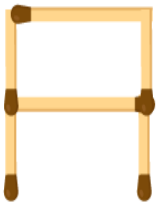
From the figure we observe that 5 matchsticks are required to make a letter E. Hence, the pattern is 5n

(f)



From the figure we observe that 5 matchsticks are required to make a letter S. Hence, the pattern is 5n

(g)



From the figure we observe that 6 matchsticks are required to make a letter A. Hence, the pattern is 6n

2. We already know the rule for the pattern of letters L, C and F. Some of the letters from Q.1 (given above) give us the same rule as that given by L. Which are these? Why does this happen?
Solutions:

We know that T require only two matchsticks. So, the pattern for letter T is 2n. Among all the letters given in question 1, only T and V are the letters which require two matchsticks. Hence, (a) and (d).

3. Cadets are marching in a parade. There are 5 cadets in a row. What is the rule which gives the number of cadets, given the number of rows? (Use n for the number of rows)
Solutions:

Let n be the number of rows

Number of cadets in a row = 5

Total number of cadets = number of cadets in a row × number of rows
= 5n

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.)
Solutions:

Let b be the number of boxes
Number of mangoes in a box = 50
Total number of mangoes = number of mangoes in a box × number of boxes
= 50b

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

Let s be the number of students
Pencils given to each student = 5
Total number of pencils = number of pencils given to each student × number of students
= 5s

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

Let t minutes be the flying times
Distance covered in one minute = 1 km
Distance covered in t minutes = Distance covered in one minute × Flying time
= 1 × t
= t km

7. Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots) with chalk powder. She has 9 dots 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?
Solutions:

Number of dots in a row = 9
Number of rows = r
Total number of dots in r rows = Number of dots in a row × number of rows
= 9r
Number of dots in 8 rows = 8 × 9
= 72
Number of dots in 10 rows = 10 × 9
= 90

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.
Solutions:

Let Radha's age be x years
Leela's age = 4 years younger than Radha

= (x – 4) years

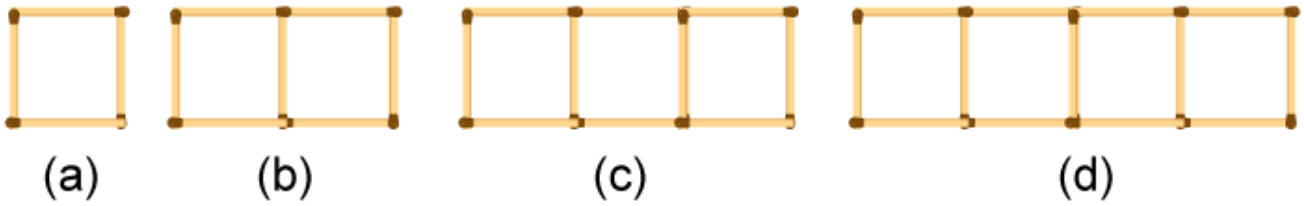
9. Mother has made laddus. She gives some laddus to guests and family members; still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?
Solutions:

Number of laddus mother gave = l
Remaining laddus = 5
Total number of laddus = number of laddus given away by mother + number of laddus remaining
= (l + 5) laddus

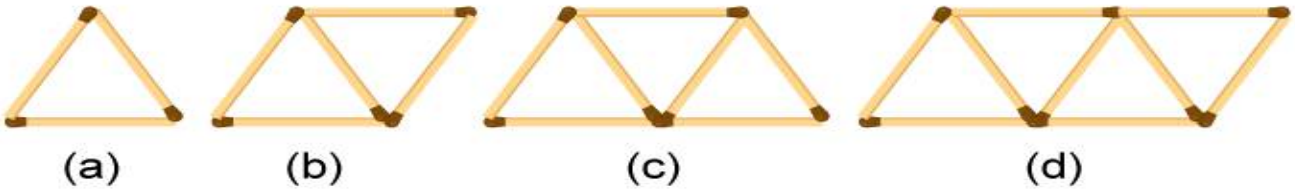
10. Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still 10 oranges remain outside. If the number of oranges in a small box are taken to be x, what is the number of oranges in the larger box?
Solutions:

Number of oranges in a small box = x
Number of oranges in two small boxes = 2x
Number of oranges remained = 10
Number of oranges in large box = number of oranges in two small boxes + number of oranges remained
= 2x + 10

11. (a) Look at the following matchstick pattern of squares (Fig 11.6). The squares are not separate. Two neighbouring 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 vertical stick at the end, you will get a pattern of Cs)
(b) Fig 11.7 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.



Solutions:
(a) We may observe that in the given matchstick pattern, the number of matchsticks are 4, 7, 10 and 13, which is 1 more than the thrice of the number of squares in the pattern
Therefore the pattern is 3x + 1, where x is the number of squares

(b) We may observe that in the given matchstick pattern, the number of matchsticks are 3, 5, 7 and 9 which is 1 more than the twice of the number of triangles in the pattern.
Therefore the pattern is $2x + 1$, where x is the number of triangles.